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ORIGINAL ARTICLES.

THE PROPHYLAXIS OF MEASLES.*

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I consider it a pertinent question whether our age, which has won the battle with smallpox and cholera and has now thrown down the gauntlet to diphtheria, is justified in keeping its hands folded in its lap when the spread of measles is considered.

In the twelve years, 1882 to 1893, inclusive, there were reported in the district of Stettin, 36,990 cases of measles, with 1090 deaths—2.94 per cent. In 1890, the death rate was only 1.2 per cent.; in 1884, 7.1 per cent. The epidemic which invaded the southern half of the Greifenberg district in 1884 was benign in the beginning; afterward, in Triglaff and surrounding localities, it became grave, not only through the severity of the disease itself but on account of sequelæ. The epidemic in Hokendorf, in 1886, was at first benign but became suddenly malignant, seven deaths occurring in two weeks. In 1887, at Pflugrade, nine out of twenty-two patients died, a mortality of 40 per cent. These observations indicate that the policy of "laisser aller" is not justifiable, and place the prophylaxis of measles among the first of medical duties.

In the good old days, the healthy brothers and sisters of a measles patient were placed in the same bed with him, with two objects in view, first to limit the sickness in a family with several children to a month; secondly to protect the children against a later and, perhaps, a severer infection. I have found spirited opponents of vaccination who have advocated this principle of immunizing against measles. With vaccination, according to the latest statistics, 13 have been lost out of two million and, in return, the serious epidemic disease has been almost exterminated. By purposely infecting with measles, we run the risk of losing from 3 to 7 per cent., even up to 40 per cent. of older children. What have we gained? Nothing, for measles epidemics can repeat themselves after ten, seven or even three years. A colleague has cited a case in which a man had four attacks of measles, the last and most severe at the age of seventy.

The course of the epidemic in Stettin was grave. 507 localities were invaded. Since the extension of the disease is due to a contagium, it is self-evident that it depends on human intercourse, not, in general, on the intercourse of important business but, because measles is a children's disease, on the intercourse of children from a few neighboring villages. Measles is only occasionally contracted on account of

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railroad journeys, and the epidemics very seldom make great strides. Far more frequently, the progress is slow from one village to one or more neighboring villages. The creeping of an epidemic is well illustrated in that of 1887 in Greifenberg. It began in Zirkwitz in April and progressed, for the most part, from west to east. After a period of four weeks, it broke out in the next village, Gross Zapplin, on the highway to Treptow. From Treptow, it proceeded to Robe and finally reached Camp where the epidemic died out in February 1888. The measles occupied ten months in going about fourteen miles.

That a disease so clearly contagious as measles spreads so slowly is due, chiefly if not exclusively, to the fact that extension occurs from school children, who do not travel so much as grown persons; that it has a period of incubation rather long as compared, for example, with cholera; that epidemics spread equally at every season; that wind and weather have no influence; that drainage has caused no movement from west to east, and, also, no opposite movement. All these facts show that measles is a purely contagious disease in the sense that Koch's cholera and Behring's diphtheria are, and that, therefore, Pettenkofer's theory completely fails. Sixteen cases are cited in which the beginning of an epidemic could be traced. In the great majority of instances infection occurs by personal contagion, but it may rarely occur through third persons or objects. I will not cite cases from literature but will refer to cases of my own.

In 1883, Miss K., of Greifenberg, aged 23, received a letter from relatives in Berlin, informing her that the children were sick with measles. She immediately burned the letter but was taken sick with measles twelve days later. Measles was not prevalent at Greifenberg at the time. In the village of Dummadel, measles was prevalent, involving, among others, the family of the teacher. In the neighboring village Broitz, which was not on the same highway, the teacher's children took the disease. They had not been away from home, there had been no communication between the villages except, perhaps, by travelling butchers. There was brought daily, however, a mail bag from the post office in the former place to that of the latter, both offices being in the teachers' houses. I might remark that the disproportionate frequency with which primary cases of measles, scarlet fever and diphtheria occur in the families of teachers, and in the school house, may well be explained by this method of conveyance. It might be objected that, in this case, the families of postmen ought to afford a considerable contingent of such primary occurrences, as is not the case. But grown persons are not very susceptible to these diseases and, in cities, postmen's children have nothing to do with the mail bags. In the country, on the contrary, the post office is in the teacher's sitting-room or parlor and the little satelites of the office greet the arrival of the carrier with joy and are present at the emptying of the mail bag so that, if contagion is possible through letters, it may very well occur in this way. I believe it proper to remove the post office from the school house whenever thus endangered by the outbreak of infectious disease. This action should be possible without recourse to the superior postal officials.

There is no doubt but that infectious diseases are often communicated at funerals. Marriages, to which children are almost always admitted, more frequently lead to the propagation of measles than do funerals. Children in charge of herds, going from one village to another, may easily carry measles. Travel from country to city for the purpose of making purchases, the great church festivals and the movements of day laborers are other unavoidable causes of infection. Instruction preparatory to confirmation affords a marked opportunity for infection. Children from villages thus far immune, come in contact with sick and infected children from other places and themselves become carriers of infection. It is manifest that the same may be said of confirmation. For example, measles was prevalent in Rörchen and the district physician made the following note. "At the same time, I would call attention to the fact that confirmation instruction, especially the blessing on Palm Sunday, must certainly be postponed, since the children of Jaedersdorf then come with their relatives to Rörchen." Later, when the epidemic appeared in Jaedersdorf, the same medical officer observed. "Referring to the origin of the epidemic, it is interesting that the postponement of the blessing from Palm

Sunday, according to my recommendation during the epidemic of measles in Rörchen, was not carried out, and that the disease broke out in Jaedersdorf exactly fourteen days after Palm Sunday." I will add that the disease was very severe in Jaedersdorf and killed two children. Was it really impossible to postpone the confirmation three weeks? With the clergy we often find sanitary rules opposed by a deep-rooted indolence. It is not merely indolence, however, but a sentiment that assumes to be a firm trust in God and, after all, is nothing but the grossest fatalism. "If children are to have the disease, sanitary rules will do no good." On a journey through the desert, Mahomet found a man encamped for the night without having tied his camel. Mahomet asked him why he had left it loose. "I have given the camel into the care of Allah!" To this the prophet replied "Next time, my son, first fasten your beast and then commit it to the care of Allah." If this saying of the prophet, which contains the quintessence of all sanitary principles, is accepted by his followers at present, then it must be a genuine pleasure to be a medical officer among the Turks.

Almost all the opportunities for the spread of measles, namely the movements of day laborers, the hiring out of children to tend herds, confirmations, the majority of marriages, the journeys of the peasantry to make purchases in the cities, occur with remarkable agreement at a certain time of year, namely at Easter. If measles is really a purely contagious disease, an increase in its frequency ought to follow the Easter festival. I have prepared a table showing the average prevalence, as compiled from statistics of twelve years, of measles for each week of the year. This shows that a maximum was reached eight weeks after the return of the country workmen, and six weeks after the average time for Easter.

[Note. The maximum is about 1360 cases. There are two other marked elevations of the curve, which reaches 1100 just before the workmen's return, and 1225 in the 49th week of the year. The chart gives one the impression that the prevalence of the disease follows a semi-annual fluctuation, reaching minima about the first of March and the first of October; reaching maxima about the last of May and the first of December. A. L. B.]

One might at first think, considering the duration of incubation, that the maximum would occur fourteen days after Easter, but we find the explanation if we bear in mind the development of a school epidemic. At first, one child is taken sick; he infects four or five others who are taken sick about fourteen days later; from these, the whole school is infected. Thus it comes about that in the country the school becomes empty usually four weeks after the beginning of the first case. In the progress of the epidemic whereby, for example, four villages become infected, the culmination of the epidemic is naturally delayed two to four weeks more, that is, six to eight weeks after the real origin. So too in cities of four to six thousand inhabitants we find the height of the epidemic eight to ten weeks after the beginning. In still larger cities this point varies according to the conditions in the various districts and in the individual schools.

According to these facts, the prophylaxis of measles recommends itself without need of further argument. If from our increased knowledge of the cause and routes of infection of cholera we have reached practical results in the management of this disease, we must contend against a feeling of hopelessness on account of the marked communicability of measles. The long period of incubation affords time for action, the bearers of infection are children whose movements we can easily control—contrast the difficulty of controlling the movements of commerce and business—and the contagium has but slight viability outside of the body.

We have seen that a conveyance of measles by objects (letters) is possible. Still, this is not a frequent cause or it would be more often noted in a collection of the statistics of a large number of epidemics. That measles is so seldom conveyed by third parties but almost always by direct contagion, is opposed to the ubiquity of the germ. It is demonstrated that measles has not a particularly high grade of contagiousness, for a child in the height of the infective stage (i.e. during the three days before the appearance of the eruption) can infect only four or five out of 80 or 100 children crowded into the same room for hours at a time. It remains for the four or five new foci of disease with especially favorable circumstances in the school

room, to accomplish the infection of the rest of the children, though they are susceptible. It is highly improbable that, as has been generally believed, healthy children may be infected on the streets by inhaling matter coughed or sneezed up by patients.

The time of incubation is nine to eleven days. To this is added the duration of the prodromal stage, three days. In general, then, the rash is to be expected 12 to 14 days from the time of exposure. The infectiousness begins with the stage of prodromes, that is with the catarrh. Neither the rash nor the scales after the eruption are infectious when implanted on healthy skin. It is probable that the germs are lodged directly on the mucous membrane of the nose and throat by inhalation of matter sneezed and coughed up.

The process of infection of a school already described can, in my opinion, be limited. The first case of measles in a community, occurring in a person of school age, should cause the closure of the school. Then we must wait and see how many children have been infected by the first. We must not only wait for the prodomal symptoms—for they can not be distinguished from those of an ordinary catarrh—but for the appearance of the eruption. For example, if four or five other children are taken sick within fourteen days, they are to be kept away from school, along with others that may show prodromal symptoms, and the school re-opened. If isolation on this line is successful, we can ward off an invasion of measles for a decade or longer. If it fails, there has been the loss of instruction, which would not occasion the same inconvenience as when, in the course of an epidemic, the school has been closed spontaneously and the medical officer has had to maintain the closure for two or three weeks more, until the epidemic had subsided. There is no doubt that the closure of the school when half or more of the pupils are sick, has ceased to be a prophylatic measure against the spreading of the disease, which then continues to extend. Likewise, I consider it quite proper to continue the interruption of instruction after a school has closed spontaneously. It is not right that children should begin school again as soon as they are free from fever and eruption. Bronchial catarrh continues in many cases and, particularly in tubercular children, there is a cough for a long time, so that the air of the school room is vitiated by the convalescents from measles. Furthermore children are rendered liable to sequelæ. Even healthy children easily become sick when attending school in winter, especially if the paths are not passable. Thirdly, that convalescents from measles may not suffer from conjunctivitis it is important that they should not return too early to their studies. In the military levies are found whole yearly lists whose members have corneal malculæ dating from measles.

Closing school has also a certain educational value. In the management of measles, the country people, the teachers, the parish magistrates will learn what is meant by an infectious disease. They will learn more than from epidemics of diphtheria and scarlet fever, which are less typical. Localities in which schools have been closed on account of measles, will, at the outbreak of another infectious disease, cooperate with the medical officer. At the first alarm of an epidemic of measles, the medical officer should be sent for without delay. He should not depend on written orders, but should make a thorough personal examination as to the time, place and circumstances of the outbreak—a task which the general practitioner dislikes to undertake.

I pass over the general methods of combatting epidemics, but one consideration forces itself on our attention on account of the usual manner of infection of measles through the fine masses dispersed in the air by coughing and sneezing. We naturally think of some means for disinfecting the air. Formalin, which is nontoxic in efficient dilutions, perhaps a lysol spray; a steam of vinegar, or any one of the other sprays that have been discarded as useless may be effective against measles since the bacillus is very notional as to its soil, cannot be cultivated artificially, and so perhaps can be limited in its development by altering the conditions of the respired air or the nasal secretion.

Finally, the question still must be considered, "What do we gain when we protect a locality from an epidemic?" Glance at the chart of the Greifenberg district. It shows that the epidemic of 1887, which traversed the northern half of the district, could have been avoided if the disease

could have been stamped out in Zirkwitz. Nor can we say that these localities would probably have succumbed to an epidemic of measles in a few years. In our district, quite a number of places have remained free from measles during the twelve years, 1882—1893. Moreover, the reports do not indicate that the longer places are protected from measles more severe does the disease become. On the other hand, an epidemic of measles may repeat itself within this period. Fifteen localities were revisited by measles in periods varying from two to ten years after the first epidemic, the average being six years.

The last epidemic in Traptow differed from the one three years previously in affecting principally the little children. Half of the primary pupils were out of school, only a few from the lower grades of the city school, a few individuals from the girls' school and none from the gymnasium. The epidemic of Wegerim is interesting in that instruction was interrupted from March 27 to May 1, 1891, and from January 17 to February 4, 1893, on account of measles. It is, therefore, not only a weak consolation but an actual error to believe that a locality is protected from a second epidemic for a decade.

Away with the old misconception that we do children a kindness in exposing them to measles. For the danger to which we subject them, we have no compensation. There is no law of nature according to which measles must revisit a place every seven, fourteen or fifty years. It is a preventable disease. None of the observed epidemics are like a breeze filling a locality as if from the sky, nor like a fog ascending from the ground. Each has proceded from one or two patients whose appearance on the scene has been an entirely accidental occurrence. The individual cases may be partly avoided, partly rendered harmless by vigilant prophylaxis. Meantime, the theory of an inevitable, periodic return of an epidemic of measles, collapses.

FRACTURES OF THE SKULL.*

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Ten years ago I published a report of ten cases of fracture of the skull. These cases had been treated by immediate operation, by secondary operation and on the expectant plan. The deductions pointed clearly to the propriety of immediate operation, provided any depression could be detected.

Since that time I have seen two cases of supposed fracture and seven cases of fracture of the skull, not including four cases in which death was immediate. These nine cases will be reported as fully as time will permit.

Case I. S. B., colored, age about 50 years, was struck on the head with a club. When I saw this patient, soon after the receiving of the injury, he was conscious and suffering considerably from shock. An examination revealed a scalp wound five inches long, extending upwards and backwards from the inner end of the left eyebrow. On exploring the skull beneath the cut a crack was found corresponding in length to the scalp wound. There was no depression or symptoms of compression or paralysis. The scalp wound was sewed up and in a few days the case went from under my care. Four weeks from the time of the injury I was again sent for and found the man delirious, with a high fever, and in answer to an inquiry regarding pain he placed his hand over the cicatrix. I saw him again in a day or two only to find the symptoms aggravated. Going away from home, I did not see the case until after death, it occuring six weeks from the time of receiving the injury.

The post-mortem examination showed, at the lower end of the above described scar, a very small opening, about the diameter of a pin, through which pus es-

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caped. On removing the scalp, the crack in the skull was plainly visible. One inch from the lower end of the crack a second crack branched out, and, extending in a semi-circle joined the first about two inches from the starting point. Union had taken place, but at the lower end of the fracture there was a small hole corresponding to the one in the scalp and of the same size. This same hole also extended through the covering of the brain. In this region the dura mater was thickened and adherent to the brain. The front half of the left side of the brain was bathed in pus. On opening the left hemisphere an abscess three inches long and one and one-fourth inches in diameter was found occupying the anterior, and a portion of the middle lobes. So far as could be discovered, this abscess did not connect with the exterior of the brain. There was no depression of the skull. The fracture involved both tables.

Case II. T. D., age 22 years, was struck on the head with a bottle in a barroom fight. Skin not broken. This injury was received between four and five o'clock in the afternoon. No ill effects were apparent and he was arrested together with the others concerned. After spending the night in prison, he went home. About noon he became sleepy and laid down. During the afternoon his heavy breathing attracted attention and an effort was made to waken him, but it failed. When I saw him, with another physician, he was in the arms of death. He died thirty hours after receiving the blow. A swelling just above the left ear, under which a depression in the skull could be felt, made the cause of death apparent.

On entering the scalp, at the post-mortem examination, we found a depressed fracture one and one-half inches long by one-half inch wide. Some irregular pieces of bone, corresponding to the opening in the skull, were driven into the brain. Upon removing the calvarium we found a large, oval shaped clot of blood occupying the left parietal region. This clot measured four inches from front to back, and extended from the crown down into the middle and posterior fossæ of the skull. It filled a pint cup two-thirds full. On further investigation we found a small sharp-pointed spicula of bone sticking into the middle meningeal artery. This no doubt, explained the delayed symptoms of compression. The blood had slowly but steadily leaked out from around the piece of bone and gradually produced the large clot. Had surgical help been called in time and the head operated upon, a life might have been saved. This was a case of traumatic ingravescent apoplexy.

CASE III.—F. K., age 15 years, was found in an unconscious condition, lying on the floor of a manufacturing establishment. He died a few hours after, without regaining consciousness. The attending physician found no cause of death.

In making the post-mortem investigation, I found, upon a superficial examination of the head, a large depression in the skull at the upper portion of the left temple. The removal of the scalp—which was not cut by the injury—exposed a comminuted, depressed fracture of the skull, circular in form and as large as a silver half-dollar.

The question arises, "Would an immediate discovery of the injury followed by a prompt removal of the depressed pieces of the bone have saved the life?"

CASE IV.—L. K., age 4 years, received a kick from a horse. The wound in the scalp began just above and at the middle of the right supra-orbital ridge. It extended upwards and somewhat outwards for a distance of three inches.

The horse had just been shod and the kick had buried the toe of the shoe in the skull. Fragments of bone were driven into the brain, lacerating its coverings. This case was seen at once. Unconsciousness was complete and the shock severe. Without delay the sunken pieces of bone were removed, along with considerable brain substance. The scalp was so bruised and lacerated at the upper end of the wound that immediate union did not take place at this point. Before the head was entirely healed the boy fell from a porch and broke his left thigh. He recovered nicely from both injuries, and, excepting the scar on the forehead, shows no indications of either. At no time was there any paralysis, and in 24 hours consciousness had returned.

Case V. E. T., age 15 years, received a large, irregular, compound fracture of the left forehead by a blow from a stone. For a moment the boy seemed dazed, but he did not lose consciousness. The dura

mater was lacerated and some brain tissue lost. There was no paralysis. A few hours after the injury an anæsthetic was given in order to remove the depressed pieces of bone. The patient was nearly ready for the operation when he stopped breathing. Artificial respiration, electricity and the injection of stimulants were resorted to, and, after nearly an hour's work, the boy could breathe without assistance. The operation was postponed until the next day. Before making the second attempt a hypodermic injection of morphine and atropine was given and no trouble ensued. The pieces of bone were removed, and in a week the patient was sent to Dayton, O., into the care of Doctor C. H. Humphreys, of that city. The Doctor writes me as follows:—"The boy recovered after some delay in getting rid of a small pulsating fungus growth from the seat of injury, which when removed was disposed to return. After deep incision of it and cauterization it closed over."

Case VI. F. D., age 7 years, was run into by a horse and thrown head first against the end of a fence rail. The tapering but blunt end of the rail penetrated the crown of the head to the left of the median line, for over an inch. This occurred in the evening and I saw the boy the following morning. He was then conscious and had no pain. Paralysis of the right arm and leg was complete, but he had control of his bowels and bladder. After cleaning out the fragments and destroyed brain tissue, there was a deluge of blood, seemingly from every part of the cavity. A prompt stuffing of the cavity with gauze stopped the flow and warded off what looked like impending dissolution. A relative of the boy gave a good idea of the size of the hole by saying, "You could drop a hen's egg into it." The gauze was removed in three or four days, and no further trouble was experienced from hemorrhage. The scalp had been so lacerated by the blunt end of the rail that it could not be made to completely cover the opening. This healed by granulation, but, in time, the brain, not having much opposition, protruded through the skull but under the scalp. This tendency to hernia was obviated by making a round lead plate about three inches in diameter, and one-half inch thick in the middle, gradually tapering to the edges on one side, the other side being left flat. The flat side was applied to the hernia, and the plate so encased in a bandage as to hold it in place. This was worn for several weeks and cured the hernia. The paralysis gradually left, and the last report from the boy was to the effect that he was in school, bright and active as ever.

Case VII. S. S., age about 40 years, received long scalp wounds across the occiput, the crown and on the left forehead. They were probably made by a pick handle. Under the wound on the forehead there was a fracture of the skull. I saw this man within an hour after the receiving of the injury. He had bled profusely and was partially conscious, with no paralysis. As he had been drinking it was hard to tell where the effects of the liquor left off and those of the injury began. The depressed pieces of bone were removed and the dura mater found to be only slightly cut. The hole in the skull was circular and would admit a silver quarter. All of the cuts healed without suppuration, and the patient made a speedy recovery.

Case VIII. S. R., about 22 years of age, was found lying in an unconscious condition alongside of a railroad track. The only evidence of external injury was a large "bump" on the top of his head. Both pupils were contracted; paralysis was complete, and the indications pointed to a fracture of the skull, although none could be detected by external manipulations. A long half-circular incision was made around the posterior part of the swollen portion of the scalp. A large "scalp lock" was raised, but no fracture found. For ten days this man remained unconscious, with paralysis of the extremities, bowels and bladder. At the end of that time he began to improve, and so continued until he was up and out. Noticing that his mind seemed dull, I spoke to a friend regarding it and attributed the mental deficiency to the injury. The friend replied that "he had as much sense as ever he had and he never had much."

The incision made in this case proved, so far as external appearances could, that the conditions present were not due to depressed bone. There was evidently compression either from within or without. The history of the case, the complete paralysis present along with the other symtoms, made me to expect to find depressed bone beneath the swollen scalp. This

point would still be in doubt but for the investigation made.

CASE IX. J. M., aged 16 years, was struck with a billiard cue just above and a little posterior to the left ear. This happened at noon of February 11th, 1895. The primary effects of the blow were slight, but five hours afterwards, while on his way home, the boy became semi-conscious and was helped home and into bed. He was soon soundly sleeping and the family thought the condition was due to drink. At three o'clock that night the patient's bed-fellow was disturbed by the loud breathing and tossing of the boy and called the lad's father. The father knew that the boy had been hit and at once connected his condition with the blow. Dr. J. C. Crossland was sent for and arrived at five in the morning. The following were the conditions, as reported by the Doctor:—"Left pupil dilated, pulse irregular, heart action violent, breathing rapid and stertorous with puffing of the cheeks on expiration, frothing at the mouth, delirium and frequent epileptiform seizures, profuse sweating, temperature 103°." At eight o'clock I saw the case with the attending physician, and continued to see it almost daily for a month. The only local evidence of injury to the head was some swelling and discoloration of the scalp above the left ear. Dr. Crossland, during our first consultation, raised the scalp at this point but there was no injury, at least externally, to the skull. It was evident that inflammation had begun inside the skull. The coma was increasing and the restlessness continued. The head was rolling from side to side with a continual effort to burrow in the pillow. By night the right pupil was contracted and immovable; the temperature was 105°. The second or third day the pupils became dilated, but otherwise there was little or no change. The bowels and bladder were not controlled from the first, or for three weeks following. The symptoms on the fourth day were somewhat better, but on the fifth day his condition became aggravated with paralysis of the left side of the face, and the left pupil was drawn outwards. The evening temperature was 106½°. On the seventh day he had several severe chills. On the tenth day it became evident that the inflammation had followed the optic tract into the left orbit. On the fourteenth day the ball was opened and the distention relieved by evacuating the pus; the eye healed, leaving a good stump for an artificial eye. Three weeks after the injury, symptoms of pyæmia developed, followed by abscesses on the right elbow and hip. These were opened without delay. The delirium continued for three weeks and then gradually subsided, until at the end of six weeks the boy was rational. The abscesses all healed, and the boy steadily but slowly improved. The emaciation was extreme; from a stout, rugged coal digger, he had gone down to a living skeleton. Eight weeks after the injury and just as the attending physician was about to discharge the case, an abscess formed at the lower portion of the right lung. Some bulging of the intercostal spaces beneath the scapula was noticed and the pus let out at that point. The boy also coughed up a large quantity. This gradually subsided and now, three months from the date of the injury, the patient is fast regaining health and strength, with his mind unimpaired.

The foregoing cases present many different phases of fracture of the skull and the result therefrom. All of those operated upon recovered, and in each case the operation was performed without delay and without any regard to the symptoms present. The one idea was to remove all pieces of bone that impinged upon the brain, whether the brain resented the pressure or not. Due attention was given of course, to the physical condition so far as it was influenced by shock. The idea that "in children the toleration of the brain to pressure is such as to justify delay in elevation of the fragments unless alarming symptoms supervene" is probably true, but what is to be gained by waiting? Prompt action will probably prevent alarming symptoms and dangerous secondary complications.

In the operation reported, the trephine was not used. With an elevator and a pair of sequestrum forceps, much can be accomplished. This is not said in the way of depreciation of the trephine. It is an instrument of untold value. The anæsthetic used was the A. C. E. mixture.

There is no need of repeating textbook literature on rules and methods for operations on the skull. How to prepare the patient for the operation, how to operate

and how to treat the cases after operation are details familiar to all. There is, however a new idea being advanced or experimented with. Perhaps it might be well to say that an old idea is being revived in a new form. To find some hard substance with which to replace the bone removed has been a source of much thought in the past and it is likely that the near future will solve the problem. This may be Senn's decalcified ox-bone, disinfected celluloid plates, or it may be the bone removed, or even transplanted pieces of skull.

In looking over the literature on the subject, I was forcibly struck with the following, found in *Bell's Surgery*, 3rd volume; edition of 1796—nearly one hundred years ago:—

"In the management of fractures of the skull attended with depression, the indications are:—

1. To discover as exactly as possible the site, the course and the full extent of the fracture.

2. To obviate the effects of the injury done to the brain by elevating or removing all the depressed parts of the bone.

3. To endeavor to complete the cure by the application of proper dressings and attention to the after treatment."

PHLEGMASIA DOLENS.*

J. CAMPBELL, M.D., SEAFORTH, ONT.

REPORTS OF TWO CASES, BOTH ENDING FATALLY; THE ONE FROM SUPPURATIVE PHLEBITIS, THE OTHER FROM EMBOLISM.

I was called upon, on the 27th of October, 1884, to attend Mrs. D., æt. 39 years, in her ninth confinement. I learned that she had been lying in bed for ten days with what she called her "sore leg," and upon examination found that her left leg exhibited the worst case of varicose veins without the surface being broken that I had ever seen. I learned that she had some trouble at the previous confinement, when the friends were told by the physician in attendance that it would probably go hard with her if she should become pregnant again. From the description given I would say that the difficulty on that occasion must have been of the nature of phlegmasia dolens.

Upon this occasion the whole leg was swollen and dotted over with small tumors larger than a pigeon's egg which upon examination were found to be the tense varicose veins ready to burst.

She was five or six hours in labor but came through it fairly well without the aid of instruments. There was no flooding. The child was born alive. I remained the usual time after delivery and, as I lived nine miles from my patient, I gave her particular directions as regards cleanliness; urged her to lie in bed longer than usual on account of the leg; and advised her to have it bandaged before rising. I then left, hoping all would be well, but was recalled upon the fourth day, the messenger saying she had taken chills followed by fever, and that she was quite ill.

I found my patient with a temperature of 105°, pulse 120 and somewhat compressible. The milk had been secreted, and the lochia was free and sweet. I examined the leg and found it swollen and painful, the femoral vein being like a whip-cord and the inguinal glands tender and enlarged. The skin was tense and glazed, and at places, the veins were near the bursting point.

I told the friends that it was a case of phlegmasia dolens, or what in common parlance is known as "milk-leg." I raised the leg, ordered hot fomenations, and prescribed quinine and ammonia with whiskey and milk. I syringed the vagina with a hot 1-40 carbolic lotion; ordered the clothing to be changed every day, as had been done since delivery; enjoined fresh air and sponging the surface of the

*Read at the meeting of the Huron Medical Association.

body, and then I left. This was on October 31st. Next day the husband called for medicine and informed me that she was no worse. I visited her on the following day, also on the fourth, sixth and eighth days. Expecting the case to be a tedious one I resolved to visit the patient only on alternate days.

To condense the report, I would say that, contrary to all expectations, the case went on from bad to worse. The milk was suppressed, the lochia became scanty and of bad odor, and the leg swelled until it was twice the size of the other one. What was still more serious, abscesses to the number of over a dozen formed along the course of the femoral vein. These I lanced freely and ordered to be sponged with carbolic lotion every three or four hours. Linseeed meal poultices covered with powdered charcoal were applied and changed after each sponging. The bowels had been kept open from the first, but the motion continued unhealthy and had a bad odor throughout her sickness. She had a succession of chills followed by a high temperature, sometimes reaching 106°; then came profuse sweatings, with a dry, brown tongue and other symptoms of pyemia. The face now wore an anxious expression, the pulse ran up to 150, delirium supervened and, finally, she sank into a comatose condition and died in a state of exhaustion.

This was the first and only case of suppurative phlebitis, or what might be technically termed peri-venous cellulitis, which I ever had in a practice extending over a quarter of a century. I had given a hopeful prognosis up to the time of the formation of pus in the veins, but after that I felt that "chances and war were against us." I had no literature on the subject, but treated the case on common-sense principles,—though I find at this distance I could not have done any better.

Case II. I was called on the 29th of January last, to attend Mrs. A., aged 31, in her fifth confinement. I was only half an hour in the house when she was delivered of twin boys, both alive. The second was born about fifteen minutes after the first There was one large placenta, or rather the two were so intimately connected that to all appearances there was but one. It was nearly an hour after that that the after-birth was expelled, and then there was more than the usual amount of blood lost; so much so that I remained with her another hour compressing the uterus with my hands. Ergot had been previously repeatedly given.

I was told next day, that after I left she had lost so much blood that they were about sending for me. I found her somewhat pale, both pulse and temperature were normal, though the pulse was moderately compressible. I put her on the compound syrup of hypophosphites; told them to change her every day; wash the genitals and keep the breast empty when milk appeared, and said I would not call again unless sent for.

On the fifth day I was called in haste by the husband, who said his wife had had a severe chill and was now much fevered.

When I reached her bedside I found that the temperature was 106½°, pulse over 120, and she complained of severe headache. The breasts were swollen, hard and lumpy. I found that they fed the children and allowed the milk to accumulate in the ducts. The lochia was not suppressed and was perfectly sweet; there was no tenderness over the womb nor any signs either of inflammation or puerperal fever. As a precautionary measure I used the uterine douche with hot carbolic lotion; gave ten grains of phenacetine to reduce the temperature, and prescribed ten grains of quinine every four hours. I instructed them to empty the breasts, and ordered the nurse to keep the children at them. I was not long home when the husband called me back, saying that his wife had taken another chill. I visited her late in the evening and found the temperature 102°, which change we attributed to the medicine. Next day, the sixth after confinement, I saw her morning and evening, and found the temperature still above the normal, though in other respects she was doing fairly. I expected to find her fever nearly gone if the milk in the breasts had been the sole cause of the trouble. The temperature, on the contrary, changed from 101.¼° in the morning, to 102.½° in the evening, notwithstanding that she was getting ten grains of phenacetine and twenty grains of quinine every day. The breasts were kept empty and the bowels open.

On the evening of the eighth day, the patient complained of pain in the right elbow, but nothing was to be seen. On

the evening of the ninth day, she complained of pain in the calf of the left leg, increased upon pressure. There was also tenderness over the left groin on deep pressure.

As the temperature had been ranging between 100°, and 102½° in spite of the medicine, I suspected that she might be taking phlegmasia dolens, and told the friends so. I remarked that the next day would clear up the diagnosis. At this time the legs were exactly similar in appearance and of the same size. Next day, however, the left leg and foot were swollen, the glands in the left groin enlarged and tender, and the femoral vein could be felt hard and round like a whip-cord. This was the tenth day and the diagnosis was clear. The leg was slightly raised, hot fomentations of hops and poppy heads were applied, and she was put upon twenty minim doses of Tr. Fer. mur. four times a day. The quinine and phenacetine were still given at night, and her strength was sustained by liquid nourishment given at short intervals, especially milk and whiskey, beef tea and egg-nog. The leg did not long remain clear and shining, but soon began to diminish in size and to pit upon pressure. The temperature, too, went down to 100°, and after that to the normal. The patient did not complain of pain. The bowels were kept open by Cascara Sagrada. The pulse was seldom over 90, and after a time became normal. All of the symptoms pointed towards a mild case. Her strength, too, increased; her appetite returned and, in short, she was doing so well that I visited her only every second day.

Thus the case progressed from the 10th until the 15th day after delivery. She said she felt well enough to get up. Her friends felt annoyed to think that a woman so well should have to lie in bed from three to six weeks, as I had told them, hence they asked for a consultation to decide that point. On the morning of the 16th day after delivery, and the 6th from the day the limb began to swell, Dr. Bethune examined the patient and pronounced her, as far as he could see, out of danger. She was particularly well; she had no pain; the tongue was clean, the temperature, pulse and everything else were perfectly natural. The swelling was well down, the leg pitting freely upon pressure. Her strength was greatly increased and she was cheerful. Time and rest, the doctor said, were all that was required.

The consultation took place about ten A. M. At 2 P. M. the same day she complained of pain in the other leg, which was relieved by rubbing with turpentine and oil. The pain returned near eight o'clock the same evening, when the attendants rubbed it again; in doing so they turned her over on the left side, and even had her sittting up in bed. Suddenly she turned purple in the face; writhed and twisted as if in pain; turned her head to one side, and died. The friends thought she had taken a fit and sent for me in haste. The right leg had not swollen, and the swelling in the left leg had decreased considerably. I gave it as my opinion that death had taken place from embolism, a clot having been carried to the right heart and thence through the pulmonary artery to the lungs, cutting off the circulation in that organ. Had she lived no doubt she would have had the same disease in the right leg that she had in the left, with a very tedious convalescence.

Her death indeed was more than a surprise. It might be likened to a ship going down as she hove in sight of the harbor, with a glassy sea beneath her and a blue sky above, and not a cloud in all the horizon.

Remarks: (I) The swelling in both cases began at the periphery. The first case lost power over the limb; the second did not. The first experienced severe pain; the second had comparative immunity from pain.

(II) I feel confident that both veins and lymphatics were involved in both cases; the veins being inflamed, the lymphatics obstructed.

(III) In my opinion the phlebitis was produced by the precipitation of fibrin by the action of a septic agent which had either been developed in the blood or had made its way into that fluid.

(IV) As to the predisposing causes of the first; besides the hyperfibrinotic state of the blood in all pregnant women, the varicose veins, I believe, were the great cause of the trouble which ended so disastrously.

(V) In reference to the second; besides the condition of the blood already mentioned, and a moderately varicosed condi-

tion of the veins not previously referred to, I believe that the "head and point of offending," so to speak, was the loss of blood sustained at confinement, still further weakening an over-taxed and nervous system.

(VI) The modes of death were different: the first dying from pyemia; the second from thrombus producing asphyxia from arrest of circulation in the lungs.

(VII) In conclusion, I would say that the pathology of this interesting disease is still somewhat obscure and much has yet to be found out in reference to it.

DEAFNESS FROM INTRA-NASAL DISEASE.*

JOHN A. THOMPSON, M.D,, CINCINNATI, O.

Diseases of the ear are more intractable to treatment than those we encounter in any other department of medicine. Late cases of chronic catarrhal otitis media in either of its forms are regarded by experienced otologists as being almost hopeless under modern methods of treatment. From this hopelessness arises the constant suggestion of new procedure directed to the ear itself in the hopes of at least partially restoring the function which is so important to the happiness and success in life of the individual. A few observers, notably Swineburne, turning from the attempt to cure the already established condition, have sought to lessen the number of hopelessly deaf by seeking the cause and devising methods for prevention. Swineburne carefully examined the nose and throat in a thousand cases which presented themselves at the Harlem Eye, Ear and Throat Infirmary, complaining of deafness. Where deafness resulted from disease of the middle ear, his conclusions are that in 95 per cent. of all cases the primary lesion is in the nose or naso-pharynx.

Just how disease in these organs produces chronic inflammation in the tympanic cavity has been a question of dispute. Some experienced writers claim it is due to the direct extension of inflammation by continuity of tissue. In structure, the tympanum is only one of the accessory sinuses of the nose, though it differs entirely from that organ in function. Others have thought we could trace the resultant ear disease secondary to obstructive lesions in the upper respiratory tract, to imperfect aeration of the middle ear. Still other authorities have thought that the interference with the circulation in the internal and middle ear by the inflammatory and neoplastic changes in the nose or naso-pharynx was the cause of the secondary disease. While the battle has been fierce and the flow of ink free in this word war, it is probable that all are right; that each method plays a part in the production of secondary diseases in the middle ear.

While I have seen many cases where the secondary deafness could be accounted for and the cure understood from the well-known relations of nasal and aural diseases, I have encountered others that are not susceptible of explanation by any of the known facts in rhinology or otology. I wish to report three of these cases, chosen because they are dissimilar in many of their features. They suggest that there is a relation not yet understood, between the healthy condition of the nose and naso-pharynx and the sense of hearing. In all of these cases there has been a serious and irremedial impairment of the organ of hearing, yet in all the ability to hear has been greatly increased by restoring the nose and throat to their normal condition.

Mrs. S., aged 31 years, married when 16 years old, has suffered from diseases of the generative organs since the birth of her first child. She is very nervous, weak and anaemic. She suffered from pains in the chest, headache, cardiac palpitation, rapid pulse and dyspepsia. These symptoms could not be relieved by ordinary constitutional treatment. She was referred to me by her physician, Dr. W.

*Read before the Ohio State Medical Society, 1895.

H. DeWitt, for treatment of the upper air passages, with the hope of relieving these intractable symptoms which he believed were secondary to the local disorder.

The patient had marked hypertrophic rhinitis with a deflected and thickened septum. The thickening was in the right nostril. There was also a marked nasal-pharyngeal catarrh. The right ear was deaf to all ordinary tests. She could not hear the watch on contact. She could not hear the conversational voice. She could hear loud voices only as an indistinct noise. She gave a history of this ear as follows:—Seven years before, while suffering greatly from her uterine trouble, the ear became inflamed and was intensely painful for several days. The drum was finally perforated, the pain diminished with the free discharge of pus from the ear. She had had occasional attacks of acute suppuration in the middle ear from that time.

Inspection of the ear showed cicatricial drum membrane with evidences of old perforations. There was no suppuration at this time. The ossicles were firmly bound together by old inflammatory adhesions. The condition revealed by inspection was so bad that no attempt was made then or subsequently to improve the hearing by treatment of the ear. The hypertrophic rhinitis was treated by the usual method and the spur on the septum was removed March 13th, 1894. The headache and neuralgia of the chest which the patient had supposed were all due to her uterine trouble, were entirely relieved within six weeks after this operation. The rapid pulse and cardiac palpitation yielded to the combined effect of the operation and heart tonics administered internally. The patient began to improve in health and strength and in a short time felt better, weighed more and was better able to do her work than she had been for years. About ten months after the operation she discovered that hearing had returned to the supposed incurably deaf right ear. A careful test of this organ in April, 1895, shows that the patient is able to hear the conversational voice fairly well, and hears the watch, which before the operation was not heard on contact, two inches from the ear.

F. J. H., aged 18, had scarlatina when he was 13 years old. The scarlatina was complicated by purulent otitis media in both ears. The drum membrane and ossicles of the right ear were completely destroyed. In the left ear three-fourths of the drum membrane was destroyed and the ossicles remain bound together by cicatricial adhesions. With every cold the patient caught, there would be suppuration from one or both ears. I saw him first in March, 1894. At that time he heard a conversational voice one foot distant, could not hear a watch on contact, and could not hear a whisper at all. There was no appreciable difference in the hearing powers of the two ears. He was about to lose his situation as clerk because of his inability to carry on a conversation with customers in the store.

Examination of the nose and throat showed hypertrophic rhinitis and a large spur on the septum in the left nostril. There was a complicating naso-pharyngeal catarrh. After treating for a few days the acute inflammation that was present when I saw him, I removed the spur and cauterized the hypertrophied turbinated bodies so as to give him free breathing room through the nose. The left ear was suppurating when I first saw him, but this suppuration readily yielded to the dry treatment. The patient was under treatment six weeks and was dismissed with the ability to hear a whisper three feet and to distinguish ordinary conversation so readily that he still retains his position as clerk. The first of December, 1894, he caught a severe cold, and with the resultant swelling and inflammation of the nose and throat, his hearing became again seriously impaired. Ten days of local treatment cured this attack, and with the return of the nose to the normal condition the hearing distance for the whispered voice again became three feet for either ear.

Mrs. F. L. J., aged 35, has been deaf from childhood. I can get no distinct history of the cause of this deafness. She had repeated attacks of acute purulent otitis. In her earlier years she was treated by a number of good otologists, who succeeded in checking the suppuration but did not prevent the total loss of hearing power in the right ear. She had been constantly under the care of a competent man for three years before I saw her. She had visited him once or twice a week all this time to have the left ear inflated by the Politzer method. This inflation gave

temporary relief from the tinnitus aurium and improved the hearing temporarily. In spite of this treatment the deafness was progressive, and at the end of three years she was worse than at the beginning of this period. Examination of the ears showed the right ear with only a perception of loud sounds. Inspection of the drum showed only a mass of cicatricial tissue, through which nothing could be seen to throw any light on the condition of the middle ear. The left ear showed a badly retracted drum membrane, with cicatrices where old perforations had healed. Loud voice heard only one foot, watch not at all in left ear. Examination of the nose showed a bad hypertrophic rhinitis, and in the right nostril, at the junction of the perpendicular plate of the ethmoid with the triangular cartilage, there was an enchondroma with a broad base nearly an inch in diameter and so thick that it completely filled the upper and anterior portion of the right nostril. As all known methods of direct treatment to the ear had failed to benefit the deafness, I decided to remove the enchondroma and to restore the lumen of the nostril by cauterization of the hypertrophied tissue in the turbinated bodies. The operation was made under chloroform, October 11th, 1894. I cut the nasal branch of the ophthalmic artery in the first incision for the removal of the tumor. This complicated very much an operation always difficult to perform on account of the free bleeding hiding the field of operation. I removed the tumor as rapidly as possible and packed the nose with cotton saturated with McKenzie's styptic solution. Recovery was further complicated by an attack of follicular tonsilitis which began three days after the operation. The patient was already weakened from loss of blood and shock, so the attack of tonsilitis was unusually severe and prolonged. The immediate effect upon the hearing was of course disastrous. As soon as the patient was able to resume her visits to the office, the hypertrophied tissue in the turbinated bodies was destroyed by the galvanic cautery as rapidly as this could be done without exciting a severe inflammation. The patient remained under treatment for four months and was dismissed with hearing distance for the watch (left ear) of nine inches. She hears the ordinary conversational voice with ease. She had never been able to hear a clock which had been given her as a wedding present eight years before, until after this operation. On awakening one night, she was very much alarmed by its ticking though she was lying in bed across the room from the mantel on which the clock stood. Up to the present the improvement has continued, and I have no doubt the hearing will be better a year hence than it is today.

These three cases present a few similar features. There was in all marked nasal obstruction from hypertrophy of the normal tissues and from the growth of abnormal structures. The condition of the ears in all was such as to offer no hope of cure by treatment of the ear itself. All were benefited so they could hear ordinary conversation, the best test of hearing power, by treatment of the nose.

In the first case reported, the ear was never treated, either before or after the operation on the nose, yet as a result of this operation hearing is restored to an ear which to all appearances was hopelessly deaf.

In the third case, the patient had been under the constant care of competent men from childhood to mature life. In spite of this care, the hearing power was entirely lost in one ear and so far diminished in the other ear that common conversation could not be heard. Yet, in this case, the hearing power is restored to the ear by restoring the normal luman of the nostrils. During the time she was my patient, the ear received no treatment.

It might be said the result in these cases was due to the fact that normal respiration and aeration of the middle ear through the eustachian tube was restored. While this is a possible explanation, I do not believe it to be the true one. In the third case the eustachian tube had been kept open by constant treatment, yet the deafness was increasing. The tube remaining open, no attention was paid to it while I was treating the nose, yet there was a remarkable gain in hearing power. It certainly will not apply to the second case, where in one ear there is no drum membrane at all,and in the other ear only a remnant. The recurrence of the deafness months afterwards when the nose became inflamed and swollen, and the prompt restoration of good hearing power by treatment of the nose, is an additional demon-

stration of the controlling influence that, in this case at least, the nose has on the power of hearing.

While I do not pretend to explain the influence which brought about the deafness or the cure in these cases, there is a practical conclusion to be drawn, upon which we can act even if we do not understand thoroughly the theory or the principal on which our action is based.

The practical deduction is that no case of supposed incurable deafness is really so unless the nose and naso-pharynx have been examined, and treated if necessary, by a competent rhinologist.

BACTERIOLOGY.

There is no country in the world where such rapid advances have been made in this new department of science as in our own. It is the characterization of the American mind to glean the best thoughts of the world and utilize them in the most practical possible manner. This is the secret of the rapidity with which the various boards of health have established under State supervision and in almost every town and city laboratories with the single view of increasiug the health of their community. The intelligence with which they have incorporated into their work what is best in the discoveries of the scientists of the world and utilized it in the prevention of disease and the relief of suffering, is characteristic of the rapidity and practical working of the American mind. There is no question about the correctness of the statement of Prof. Adami that outside of Berlin the best bacteriological work in the world is done in the United States.

There is but little, if any, question at the present time that it is the product of the bacteria and not the microbes themselves which form the deadly poison of disease or those harmless changes in food so much prized by the epicure. The result depends upon the benign or malignant character of the microbes, one rearranging the molecules of tissues into the deadly ptomaine which paralyzes the vital forces, and the other being perfectly harmless. And yet the benign and malignant bacillus resemble each other so closely that even the expert with the microscope sometimes fails in differentiating them. Upon this subject Prof. Adami, one of the most accurate bacteriologists on this continent, says: There is scarcely a malignant microbe which has not its benign counterpart under the microscope. Bacteriologists do not rely on the microscope exclusively, but on the whole history of the germ which they have under observation. Its behavior in different media, such as broths and milks, it one test. Its action upon animals, such as rabbits and guinea pigs, is another. Of course those who have an every day acquaintance with the bacilli of tuberculosis or diphtheria, soon get to recognize a certain variety and fixity of form under the microscope which makes them all but sure that they either have or have not what they are looking for. Physicians who have but little practice with the microscope will generally find it safer in difficult cases involving more or less doubt, to obtain the aid of an expert.

By making pure cultures of this bacillus and giving them to the dairymen of his vicinity he won their lasting gratitude, for they found that the culture introduced into their cream brought out the sharp, fragrant taste of the Danish butter, and increased its market value by two cents a pound. Some of the most popular of the German cheese, as, for instance, the Roquefort and Gorgonzora cheese, owe that peculiar taste so much prized by epicures to the benign bacillus which sets up the green decomposition which adds so largely to the value of thoroughly ripe cheese. We see the work of this bacillus in the green mold on old shoes and decaying citrous fruits, which is precisely the same as that used by the German peasants for the past two centuries in the manufacture of this variety of cheese. They make this mold, however, by pouring acid upon bread. After standing for a few days the mold appears, which they dry and powder, and then add to their cheese while still in the curd. It is in watching the work of Nature that students are able to isolate the cause and work out the results with such positive certainty as to make them important factors in the care and prevention of disease and in those great industries which quicken the pulse of commerce.

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SATURDAY, JULY 20, 1895.

EDITORIAL.

ANTITOXIN THERAPY.

Sufficient time has now elapsed and clinical observations have been extensive and thorough enough to allow the medical profession to arrive at conclusions approximately correct as to the value of the toxin theory of the etiology of infectious diseases, and the efficacy of that theory as applied in serum therapy. This much must be allowed—assuming that the statistics offered us are as reliable as the average statistics accepted in similar questions: the antitoxin treatment has markedly reduced the mortality rate of diphtheria; and no serious complications or sequelae, directly due to the antitoxin remedy, have characterized the treatment.

At the XIII Congress of Internal Medcine, recently convened at Munich, Heubner, of Berlin, referred to the effect of the new remedy upon the mortality from diphtheria in that city, which had been 39 per cent. in 1,332 cases immediately preceding the use of antitoxin, and 21 per cent. in 1,390 cases (nearly the same number) since the beginning of the serum treatment. Out of 181 cases of pure diphtheria of which he had personal knowledge, all in which the treatment had been applied on the first or second day recovered, and only two of those in which the injections were first administered on the third day had a fatal termination.

The record in the Kaiser and Kaiserin Friedrich Hospital at Berlin was brought down to March 15, by Dr. Baginski. During the twelve months ending on that date 525 cases were treated there with antitoxine. For the four preceding years the average annual mortality had been 41 per cent., but for these 525 cases it was reduced to 15.81 per cent. The prevailing epidemic was of a virulent character. This is indicated by the fact that while the serum treatment was discontinued during the months of August and September, owing to a temporary exhaustion of the supply of serum, the death rate rose to 52 per cent.

Prof. Widerhofer of Vienna, relating his experience with the new remedy in the hospitals of that city, reported that the mortality had been cut down more than one half.

Von Ranke of Munich declared that the mortality in the hospitals of that city had been reduced more than one-half since the introduction of antitoxine.

The figures introduced are, to be sure, from European records. But it must be remembered that the investigations originated and the discoveries were made in Germany, and that in Europe serum therapy has been subject to the severest tests over the longest period of observation. Furthermore, the results recorded are fairly representative of the reports coming from all quarters where the treat- has been used to any extent. The consensus of opinion is as stated above.

So much for the practical results of serum therapy in diphtheria. And bacteriology, the youngest offspring of medical science, must be credited with making one of the most notable of all contributions to medicine.

As to the vital processes, chemical and physiological, concerned in the contest between the bacillus and phagocyte, the toxine and the anti-toxine, we can, as yet, only theorize and continue to investigate. We know enough, however, to realize that the subject is not so simple as at first conceived, and that we are only preparing to explore another unknown field whose boundaries may prove limitless. As Buckmaster (*Science Progress*) has said:

"If it can be affirmed that a disease is caused by the invasion of specific microbes, or their products, attempts to destroy these would be a strictly scientific procedure; in other words, attempts to disinfect the living body. Quinine, salts of mercury, iodine, or salicylic acid are powerful disinfectants, and also valuable drugs frequently employed in the treatment of diseases produced by the spread of bacteria in the body. In order to accomplish a disinfection of the living body numerous experiments have been made, but the results were unfavorable, until Behring and his colleagues Knorr and Boer announced that this was possible in certain diseases, such as anthrax, tetanus, and diphtheria; trichloride of iodine especially was found to possess a distinctly curative power. Behring later conclusively showed that in several diseases, among which diphtheria was included, serum yielded by the blood of an animal rendered artificially immune exerted no bactericidal action upon the bacillus of the disease, but was apparently capable of destroying the toxins produced by the bacillus. Antitoxic bodies are therefore presumably present in the blood of animals which are made immune, and serum from such animal can be both protective and curative; an already developed disease can be permanently arrested by the introduction of serum charged with antitoxins.

"Since Behring's discovery it has been established that the serum of immunized animals is prophylactic and curative for many other diseases besides diphtheria. For many infective maladies, among which pneumonia, cholera, typhoid, hog-cholera may be mentioned, this has been abundantly proved by the researches of F. and G. Klemperer, Issaef, Pfeiffer, Sanarelli, and Metchnikoff. The universal application of Behring's theory of antitoxins is, however, limited, since in tetanus and diphtheria the toxins of bacilli are neutralized or destroyed, but in other diseases the serum protects not against infection with toxins, but against infection with living bacteria. In this case it is possible that the cells of the organism, even if they do not ingest and destroy the invading microbes, as Metchniks affirms, are roused or stimulated so as to oppose the spread of infective micro-organisms or the products of these throughout the body. In the case of protection against diph-

theria the antitoxin which appears is therefore to be looked upon as the product of living cells, or as a metabolite occurring under special conditions, one of which may be the stimulation of the cell by the toxin.

"A partial solution of the therapeutic effects which follow injection of antitoxic serum in cases of diphtheria may be that the material introduced does not act directly upon the toxin, but indirectly does so by operating as a stimulus to the cells of the organism, which are then capable of producing chemical bodies which destroy the toxin, and such substances may be antitoxic in character. This conception is largely due to Roux, and under his direction Calmette, Phisalix, and Bertrand have shown that no specific action can be claimed for antitoxic serum. These observers have discovered that the serum of animals which have been rendered immune against cobra poison is antitoxic both in the body and *in vitro*. In the latter case, on warming the mixture to 70°, the antitoxin is destroyed, the toxin remaining unaltered, from which it may be concluded that the toxin remains active side by side with the antitoxin. Moreover, the serum of animals immune to rabies or tetanus is powerfully antitoxic to cobra venom. From these observations it would appear that the products of cell activity which accumulate in the blood of animals immune to tetanus, diphtheria, or cobra poison, are all of an antitoxic character similar in nature, and the view that antitoxic serum is specific for a definite bacillus or its products must be modified."

ABSTRACTS.

INSUFFLATION OF SODIUM CHLORID INTO THE NASAL CAVITY FOR RELIEF OF PAIN.

Dr. William M. Capp, of Philadelphia, writes (*Med. News.*):—

By the insufflation of sodium chlorid has been accomplished the entire and immediate relief of acute pain in the face and head in a short series of cases that it may be useful to report. The procedure is simple, harmless, and no more annoying than would be a pinch of snuff, and the medicament is commonly at hand; the effects have been very satisfactory.

In five cases of faceache from decayed teeth, in which the pain did not yield to the usual domestic applications, the pain disappeared at once upon the contact of pulverized table-salt with the mucous membrane of the nose, blown from an insufflator. There were no notable characteristics; the cases were simply such as are daily met among those who do not take proper care of the teeth. The patients were of adult years, two of them men and three of them women.

Another case was that of a woman in middle life, a cook by occupation, always having had general good health, and being strong and hearty of frame. Her face was much swollen and painful, and her condition was pitiable, the suffering having deprived her of food, sleep, and rest for three days and nights. Such was her story, and she appeared to be unstrung, nervous, and quite unfitted to attend to her work. Evidently "a cold" had been taken that painfully affected the nerves of the face. An examination disclosed the presence of six neglected and decayed teeth, sadly needing the dentist's attention. They could not, however, have been filled in the condition of her mouth and face at that time. The insufflation startled her by its unexpected sensation, and her aspect for the moment was one of pain and

bewilderment. She was directed to walk across the room, which at once recalled her to her surroundings. She said that the treatment had not given pain, but had taken her by sudden surprise, which passed off, and with it all pain had left her. Upon going home she ate a hearty meal, and after a few hours went to bed and slept all night. Having occasion to be at the house in which she lived, I saw her almost daily for a week afterward, and the pain at no time returned, and the swelling and sensitiveness subsided without other treatment.

In a number of cases of severe headache without regard to cause, relief has been satisfactory and immediate upon the application of this remedy; also in two cases of earache that did not present indications for other special treatment.

A young lady with a furuncle in the external auditory canal presented herself, suffering great pain, with the distress and disturbed nervous condition that usually accompany this painful malady. In the fraction of a minute after the insufflation there was complete relief from pain, and the temporary discomfort from the application, which was attended with great suffusion of the eyes and nose, was deemed trifling by the patient as compared with the complete relief from pain that had before been suffered. There was entire freedom from pain for about four hours, after which it returned, but in much less degree. Subsequent appropriate treatment for the disorder aided in complete recovery, which was reached without any return of the distress endured previous to the salt-insufflation. Some weeks later the same patient applied for relief from the pain caused by the irruption of a wisdom-tooth, which had made her sick and miserable day and night. She elected to submit to the same treatment as before, which was administered, and gave the same prompt and happy result. She slept well that night and had no return of the pain.

A similar treatment was given to a woman who complained of intense pain in the top of the head. The case was not taken up critically, as at the time temporary relief only was sought, but a partially developed history seemed to point to uterine disease. Immediate relief followed the insufflation of the salt, and comfort, complete and satisfactory, was secured for many hours. Subsequent inquiry showed that when the pain returned it was in much less degree, and other treatment applied to the cause of the trouble removed it. This patient was one who some months before had been promptly relieved of a distressing faceache from a decayed tooth, as previously noted, and did not hesitate to have the treatment repeated upon her.

A fellow physician during a chance conversation complained of disabling discomfort from eye-strain from overuse of the eyes in reading and work with the microscope. Upon recounting to him some of the foregoing cases he asked to have an application of the treatment, which was accordingly given. His testimony confirmed that of the patients before related. He said that the headache and painful feeling of strain of the eyes immediately left him, and the shock of surprise at the contact of the salt with the nasal mucous membrane. though not painful, was not pleasant, though probably not more so than insufflation of other powder to one not accustomed to it.

In all cases from two to four grains of finely ground table-salt were used in a glass nose-insufflator, with a short rubber tube attached with which to blow by the mouth the medicament into the nasal cavity. The charge is blown just after the patient has emitted the air from the lungs in respiration. In the case of the physician referred to, the insufflator not being at hand, a tube of paper was improvised, and served the purpose equally well. It is worthy of notice that with the exception of the physician none of the patients knew the nature of the material which was applied.

Originality in the use of this mode of treatment is not claimed by me. The first account of its application, so far as I know, is related in the *Edinburgh Medical Journal* for January, 1890, by Mr. George Leslie, as occuring in his own practice. He made a successful use of it in the treatment of obstinate, long-standing, and recent cases of neuralgia, headache, faceache, earache and toothache, and in bronchial asthma; and recounts that in many cases relief was permanent. The present note of experience is confirmatory of his paper upon the subject. The procedure would seem to offer a quick relief from pain in a class of cases that profoundly appeal to sympathy, but often baffle the best skill.

PILOCARPINE.

The drenching perspiration which has accompanied the humid atmosphere and the scorching heat of the past few days, has perhaps suggested to our mind the similimum of the only drug capable of producing like effects, jaborandi and its alkaloid, pilocarpine. For this drug the medical world is indebted, as it is for many of its most efficient remedial agents, to America. It is a native of the eastern province of Brazil, and grows in the form of a shrub to the height of some ten or twelve feet. Introduced into the pharmacœpia in 1880 it has shown new powers and an ever increasing range of action as it has been closely studied. Brunton speaks of it as stimulating the peripheral terminations of efferent nerves going to glands, and first stimulating, then paralyzing the efferent nerves going to structures composed of involuntary muscular fiber. From its stimulating action on secreting nerves, it produces enormous secretions of saliva and a drenching perspiration from all the sweat glands. This perspiration usually lasts two or three hours, and is so abundant that often from a pound to eight pounds are lost, together with the salivation, in a single perspiration. Of course this excessive loss of fluid is followed by a feeling of debility, sometimes requiring alcoholic stimulants or digitalis or strychnine to tone up the failing heart. It acts not alone upon the skin but upon the mucous membrane of the mouth, nose, throat, intestines and bladder. The physiological action of the drug points to a wide range of troubles in which we should expect marked remedial results. In almost every form of dropsy, including ascites, anasarca and hydrothorax, the rapidity with which it eliminates the water through the skin and kidneys naturally directs our attention to this drug when milder measures fail. In uræmia, where there is a partial or entire suppression of urine, and even in puerperal convulsions arising from this cause, its prompt action upon the skin and mucous membrane not infrequently relieves the system of the poison and re-establishes the action of the kidneys. The dry skin, so often seen in Bright's disease, and the intense itching, the result of the senile condition of old age, receive prompt relief. Moliere recommends in that stagel of acute Bright's disease marked by scanty urine, dyspnœa, anasarca, etc., the external application of an ointment of nitrate of pilocarpine, of the strength of 1 to 1 or 2,000 of white vaseline. Of this three ounces are rubbed on the skin over the whole of the trunk, which is then covered with a thick layer of cotton wool held in place by a bandage. If not uncomfortable it need not be changed till the next day, and can be repeated daily for ten days. He finds under this treatment a profuse diaphoresis, a marked increase in the amount of urine, a decrease of albumen, sometimes salivation, and always a rapid decrease of anasarca. In acute cases the change is very marked, and even in chronic cases he finds better results from the remedy than from any other agent.

The action of the drug on the mammary glands, is similar to its action upon the salivary glands, and its stimulating action upon these glands, when given in small doses, just sufficient to produce its physiological action without excessive sweating or perspiration, classes it among the best galactagogues we possess to increase the flow of milk in the apparently barren breast.

The action of pilocarpine upon the eye points to numerous troubles of that organ in which it may be of use. Brunton classes it with the pupil contractors, muscaine and nicotine, in stimulating the ends of the oculo-motor nerve which supply the circular fibers of the iris, while eserine produces the contraction of the pupil by acting directly on the circular fibres themselves. Following out this line of action oculists have found marked benefit from pilocarpine in glaucoma, in paralysis of accommodation, in hemorrhage into the retina and vitreous, and Gillet de Gradmont looks upon it as a specific in commencing atrophy of the optic nerve. It will be apparent that pilocarpine and atropine are physiological antidotes of each other, and each can be used to check the effect of the other upon the drug that is exerting an unsafe action.

One of the most interesting effects of

pilocarpine is its power of stimulating the growth of the hair and changing its color. Several cases are on record, reported by careful observers. Dr. Judson narrates a case of a lady seventy years of age, whose hair and eyebrows had been white for thirty years. Jaborandi was prescribed to relieve the itching and dryness of the skin occasioned by Bright's disease. The eyebrows and the hair of her head grew dark in patches, until at the time of her death, which occurred about two years after she had commenced taking the remedy, they were quite black. A new growth of black hair also appeared on the scalp under the old hair. Numerous cases are reported by different physicians, all of good standing, where the use of pilocarpine has been successful in restoring the growth, even in bald places. These cases are sufficiently numerous and well attested to warrant a trial of the drug in the treatment of the scalp. Bird fanciers have various preparations they give to birds to change their color, as cayenne pepper in changing the color of canary birds to orange, but there is no well attested fact of any drug but jaborandi having changed the color in the growth of the human hair. —*Ed. Med. Times.*

THE MEDICO-LEGAL ASPECT OF TUBERCULOSIS OF BONE.

Dr. Andrew L. Fulton in a paper read before the Southwestern Assoc. Railway Surgeons (*Railway Age*) says:—The subject which I have chosen at this time is one of great interest to us all, as I see in the near future trouble for railroad surgeons in the matter of tuberculosis of bone. A few years ago we were confronted, and very much perplexed, over the subject of railway spine, or "concussion of the spine," as defined by Professor Erichsen of London, England. His monograph was wide spread in its effect; attracted a great deal of attention, and gave no end of trouble to the railway companies and led to much controversy in the profession.

Through the study and untiring effort of railway surgeons the Erichsen idea was exploded, but not until it had cost the railroads millions of dollars for imaginary ailments and the malingering of patients, to say nothing of the just claims incident to injury of the spinal cord. Erichsen himself, within the last year, has acknowledged his error, but not until it had been thoroughly exposed through the instrumentality and energetic work of the railway surgeons.

In presenting this paper on this occasion I do not desire to be understood that as railway surgeons we are here to devise ways and means to protect railway corporations; not by any means; nor do railway officials expect it of us. It is neither the duty, the function, nor desire of the honest railway surgeon to protect any company against the payment of just claims; but it is his duty, as well as the duty and privilege of every other honest surgeon to protect it, as we would an individual, against the false claims of imposters, people who are parasites upon corporations, as well as upon the community. The subject I am about to discuss is one that I believe in the near future will prove as troublesome and dangerous to the railroad companies and other corporations as railway spine has in the past, I refer to tuberculosis of bone.

I have recently been connected with two cases of tuberculosis of bone; one of them I have simply had the history of, and presume that suit will be brought against a corporation to recover damage. The case in question is one in which a man received an injury of the ribs on the left side. According to his statement he was laid up for a couple of weeks, treated by a competent physician and promptly recovered. He was entirely well, as far as he knew, for eighteen months. About that time a swelling appeared in the immediate vicinity of the point where he says he received the injury. Some time later, two or three weeks, he complained of pain in the crest of the ilium on the other side of the body from that where he received the injury to the ribs, and still later pain in the thigh. He developed tuberculosis of the ribs, crest of the ilium and femur about the same time. The lesions are now all discharging freely. He attributes his trouble to the injury he received nearly two years ago.

The other case, in which I was called as an expert witness, is one in which action was brought by the parents of a child against the Missouri, Kansas & Texas and the Missouri Pacific Railway companies jointly. The following is a history of the case as proven in the trial: About the first of July, 1891, a collision occurred at the crossing of the M. K. & T. and Missouri Pacific railroads. The engine of the M. K. & T. train struck the rear coach, the chair car of the Missouri Pacific, overturning it into a deep ditch. The child was in the arms of its mother in the chair car. They were both taken out of the car without any apparent injury to either mother or child. At the examination of the passengers the child was observed in its mother's arms making no complaint. They went west that afternoon, some fourteen miles, to their destination, the home of the child's grandmother. The mother, on the following day, in washing the child discovered two "black and blue" spots, as she called them, at a point which she indicated to be about the fourth and seventh spinous processes of the dorsal vertebræ, both about the size of a silver half dollar. According to her testimony and that of her husband and mother, these spots remained there for several weeks and finally disappeared. The child's health, as shown by the testimony, was very poor ever after the accident. During the next spring following, about March or April, 1892, the mother said she discovered a small lump on the child's back, at a point near where the black spots appeared, but said nothing about it until some time later. During the month of November, 1892, this lump was shown to a physician, and, as he testified, was about the size of a peanut and somewhat tender. Prior to this, or soon after the accident, another physician saw the child on account of its delicate health, and it was treated by him for malaria diagnosed by the mother. Nothing had been said to him about the injury the child had received, and he therefore made no examination of it. From the last named date, November, 1892, the child grew rapidly worse, and at the time of the trial of the cause, the latter part of September of this year, this child was in a most deplorable and pitiable condition, with one of the worst forms of Pott's disease of the spine I ever saw. I may state in this connection that the child has never had any treatment worthy of the name, as no regular or qualified physician has had it in charge or been permitted to treat it.

It was alleged in the plaintiff's petition, and proved as I have related, that the accident in the railroad wreck was the exciting cause of the trouble and upon that hypothesis they claimed damage. The defendants in the case entered a general denial, but there was no way to prove that they were not wholly responsible and pecuniarly liable, except by medical testimony.

The fact that two trains collided in broad daylight, near midday, at a point where an accident should and could have been avoided, left the companies nothing for defense except what they could produce by medical testimony alone. At the solicitation of the attorneys for the roads, Mr. Richards of Ft. Scott, and Mr. Sedwick of Emporia, Dr. Outten of St. Louis, wired me to appear in behalf of the Missouri Pacific and M. K. & T. jointly. I found the local profession of Ft. Scott, where the case was pending, except Dr. Aikman, the companies' surgeon, all on the side of the plaintiff, and committed in that direction. On obtaining the history of the case and the conditions present, I found the doctors of one mind, fortified by all the works at their hand on general surgery. They were all ready to admit, and that upon authority, that Potts' disease of the spine, which the child had, was a tubercular disease; that there was a predisposing cause, tubercular, and that the exciting cause was the accident received in July, 1891, by reason of the two above named points of ecchymosis over the spinous processes related in the testimony of the plainiff.

In case of the child, B. W., referred to, I took the position that in a child six and a half months old, receiving an injury over the spinous processes, and subsequently developing tuberculosis of the bodies of the vertebræ, the disease could not have resulted from the injury as an exciting cause. I produced a skeleton and showed the jury the position of the processes, and the position of the bodies of the vertebræ in which we have the tubercular disease, taking the age of the child at the time of the accident into consideration and therefrom demonstrated the impossibility of the direct result claimed in the petition. At

that early age the vertebral column is nearly all cartilage, and the separate portions of the vertebræ are united by cartilage in three places, and the bodies are not united to the pedicles until the end of the third year. These facts taken into consideration, with the blow from the chair in the chair car, which the mother testifies hit the child on the back, would seem to point to an injury serious in its nature to the spinal cord, if indeed, any had resulted. It may be noted that a direct blow upon the spinous processes of a child, young as this one was, would have produced paralysis of the extremities below the seat of the injury at once.

I also showed the impossibility that an injury not sufficient to produce any lesion of the cord should have caused extravasation in the bodies of vertebræ at the alleged point of traumatism, The laminæ, the union of which forms the spinous process, do not fuse till about the second year, and the neurocentral suture or junction of body with the pedicle does not give us any union till the fourth year. Therefore, if it were true that trauma is ever the exciting cause, as is freely claimed by most of the authors, it could not obtain in the case under discussion, because there could be no direct connection between the point of alleged injury and the body of the vertebræ.

The jury in the case, very correctly, in my judgment, accepted the theory of the defense, and wisely found in their special finding that the Pott's disease developed in the child was not connected directly or indirectly with the alleged injury, while they brought in a verdict of five hundred dollars ($500) for the plantiff as "smart money" for wounded feelings, etc., which was just.

SEROTHERAPY IN SYPHILIS.

However valuable mercury may be in syphilis, it is very certain that it does not afford immunity against a possible attack of the disease. It then becomes necessary to discover an agent for the relief of syphilis from the new researches upon the method of the future, viz., serotherapy. It is not illogical to suppose, on the one hand, that the microbe of syphilis secretes, like other infectious diseases, a toxine which can confer immunity, and one may ask, on the other, if animals are not refractory to syphilis, because there are found in their blood chemical and other substances, by contact with which the microbes of syphilis and their products of secretion are annihilated. Hence to apply to syphilis the knowledge which in other infections has been crowned with success, is only to take one step, and that difficulty has been quickly surmounted. Injections with animal serum were made in 1891 at the "Hospital Saint Louis" in the service of M. Fournier, and under the direction of Dr. Feulard. The results of these experiments were embodied in a communication made by Dr. Feulard, and in a recent treatise by Dr. Fournier upon the treatment of syphilis. It may be said in a general way that the injections had a favorable effect. MM. Feulard and Fournier insist upon their nutritive value, and they act principally by improving the general condition. M. Feulard makes the inquiry, whether the injections of serum have a specific action, or if it is not as rehabilitating adjuncts of specific medication that they bestow their good effects. M. Fournier thinks too that it is by supporting the organism and modifying its integral nature, that the injections expedite the cure of syphilitic lesions. Both of these experimenters believe that it is a medication which renders real service where the nutrition needs to be improved. They employ the serum of the dog and the horse, the dose at first two centigrammes, afterwards one, every second day. Tommasoli has also experimented with this method, and in different memoirs he has reported the results obtained in 1892. He used the serum of the sheep and the calf, and in larger doses than those employed by MM. Fournier and Feulard. He injected from two to eight cubic centimetres daily, and did not exceed fourteen injections. The results were satisfactory, and the syphilitic indications rapidly disap-

peared after the sixth injection at the latest. Very recently Dr. Istomanoff reported to the "Societè Mèdicale du Caucase" the good effects he had obtained from serotherapy in syphilis by the method of Tommasoli. Here too the secondary manifestations completely disappeared under the influence of the injections of serum, two to six centimetres daily for fifteen injections. These two authors are careful to avoid prejudging the question of the cure of syphilis, as well as that of immunization against a new infection. Again, recently, at the Congress of Rome, Tommasoli reported that some of his patients who seemed to have been cured, had experienced relapses.

If in these cases the action of the injections of serum seem to have been favorable, it was not always so. M. Kollmann, who claims the priority of this process of hemotherapy in syphilis, employed the serum of the sheep, calf, dog and rabbit, and the results were negative. The injections did not protect the patient from secondary attacks, but they had a favorable influence upon the disease. At the Congress of Nuremberg in 1893, Kollmann returned to this question. At that time he had experimented with eighteen cases, and despite the increased doses of the serum, he declared that he had never obtained a favorable result. Indeed, in some of the cases, new syphilitic complications had supervened during the injections, or a short time thereafter. Dr. Mazza, of Cagliari, instituted some comparative experiments after the method of Tommasoli, the results of which were always negative.

From the few experiences of the different authors whom we have cited, it may be said that the results obtained from the injection of animal serum in syphilis are at least problematical. The serum of an animal that has not been duly prepared—we shall see later on the importance of this term—does not seem to have either a curative or protective influence. Not only does the disease continue to progress, but the specific lesions are not modified. But this it not to say that serotherapy should be rejected, for in syphilis, as in other infections in which serum has been employed, it has shown its tonic action and its power to rehabilitate and renew the weakened organism, so much so that it seems that it is to the favorable modification which it impresses upon the whole organism that may be attributed the few successes which have been observed in the new experiences of serotherapy in syphilis. In other words, this method is a form of medication not specific, but simply adjuvant.

In the preceding researches, the experiments have been inspired, as one may readily see, by those of MM. Richet and Hericourt upon the serotherapy of tuberculosis. The argument is this: If animals are refractory to syphilis, it is because their blood contains substances which destroy the syphilis virus and confer immunity. This reasoning, to speak truly, is a little specious. It supposes that it is the blood alone which exercises an immunizing power, and takes no account of the biological qualities of the cells of the organism. But let us have done with theory, and confine ourselves to the practical. It may be concluded that animal serum does not affect syphilis any more than tuberculosis, and that it has neither specific nor immunizing power. Let us pursue the concatenation of ideas. The blood of the animal that has not been prepared seems to be insufficient; but would it be so, if by injecting the microbes of syphilis, the quality of the blood is changed? We recognize the principle of anti-diphtheria injections, but here we dare to deal with the unknown. We ignore that which may be the micro-organism of syphilis. It is not merely the question of injecting an animal with microbic cultures, but it is to try what may result from the injection of a certain quantity of blood taken from a syphilitic human being. What modifications can the syphilitic blood produce upon the blood of an animal that can make it an agent for inoculation? A problem as yet; but we shall see experiments made in this direction. Syphilitic blood is injected into an animal, and we will suppose, whether right or wrong, that its serum has acquired new immunizing properties, and will serve to inoculate syphilitic patients to cure them, or healthy individuals to protect them. As above said, the serum is prepared, but it may at once be seen that such a method is empirical, and that it pre-supposes a solution of numerous questions. In place of making the syphilitic virus pass through the animal organism, by which it may be destroyed most probably, why not inject

directly the serum of syphilitic individuals. This serum contains anti-toxine, and when injected into a newly infected individual would produce immunization. These are the theories that, as we shall see, are applied in the following experiments.

The inquiry is progressing, and inspiring more recent researches. Immunization is demanded, not from the blood of a refractory animal, for the reason that it escapes, but from blood that contains the products of microbic secretions. C. Pellizzari injected syphilitics with the serum of other syphilitics. The blood came from tertiary syphilitics, or from secondary that had already been treated. The serum was injected under the skin, of strength one half to one c.c. The method was satisfactory, but in 1892 the conclusions were not positive. Two years thereafter the inquiry was renewed, and the patients were in a satisfactory condition. By reason of the small number of patients, the author does not declare any positive conclusions, but he remarks that in many of them, because of their general condition and the indications presented by the disease, the prognosis would have been much more grave than it is. M. Pellizzari insists upon this fact, viz., that the results are much better than those produced by serotherapic treatment, and it supports his theory by which the serum exercises an immunizing action upon the tissues not yet invaded by the virulent agent. Bonaduce has made experiments of the same kind. Discarding theoretical views, he employed the serum of children hereditarily syphilitic, thinking that it contained a large proportion of substances for inoculation. He procured from three children thirty-five c.c. of serum, and after having added 100 grammes of water and raised the mixture to 100 degrees of temperature during ten minutes, he gave twelve injections to a patient recently attacked with syphilis. The chancre healed, the swelling diminished in volume, and seven months after the patient showed no syphilitic manifestations. This experiment is unique; it is impossible to discuss its *modus operandi*, but we are forced to recognize that it is no less practical.

In the following experiments MM. Richet and Hericourt provided themselves with the serum of an animal—dog and ass—with which, in default of the unknown microbe of syphilis, they mingled blood taken from syphilitic patients at the secondary period. A few days after inoculation the blood was injected into some syphilitics. The authors report two observations; one, an old case of syphilis, in whom locomotor ataxia was beginning, and in whom six c.c. injected three times, produced a marked amelioration. The other case was that of a young woman affected with syphilitic ulcerations. During a week she had injections of serum of one to three c.c.; total, twenty-two c.c. Under their influence the syphilitic conditions improved, ulceration cicatrized; general amelioration; specific treatment had been tried previously but failed. MM. Richet and Hericourt were preceded by an Italian experimenter, Dr. Mazzade Cagliari. He injected sheep with the blood of syphilitics taken at the latest period. The inoculations of this animal serum were afterwards practiced upon syphilitics subjects, and although he reported but four observations, the results were encouraging.

It may be said that in this second series of experiments made with the serum prepared, as it were, in opposition to the serum of animals that were simply refractory to syphilis, the results would be very encouraging. It would be the same with those based upon direct injections from man to man of blood infected by syphilis, and these experiments would be more satisfactory to the mind than all others. If the blood contains an anti-toxine, it is very certain that it is in the blood of a syphilitic directly injected and that the chances would exist in the greatest degree of securing the maximum of effects. If we knew the microbe of syphilis, it is also certain that the injection of microbic cultures into animals would simplify the question, and that we could hope for syphilis the same marvelous results that have been obtained in diphtheria and a number of infectious diseases. In showing the difficulties which environ the practice of serotherapy in syphilis, credit should be given to the first results, which, though few in number, are on the whole, very encouraging. As it rests upon a just idea, of which proofs have been given, let us wish for it success, and who knows that one day, not far distant, we can vaccinate against the "big pox," as we have for a century against the smallpox. In a few months it will be just a century since Jenner inoculated vaccine. *This* would indeed be a glorious anniversary!

SOCIETY REPORTS.

PHILADELPHIA ACADEMY OF SURGERY.

April 1, 1895.

Dr. Thomas G. Morton presented two recent adult cases, illustrating

EXCISION OF THE ASTRAGALUS FOR INVETERATE EQUINO-VARUS.

I have on several occasions presented to the society the results following excision of the astragalus for the rectification of equino-varus, congenital or acquired, but I do not remember that we have had before us, as yet, the results after such operations upon adults.

The first case I show you was brought to the Orthopedic Hospital by Dr. Wentz of Scranton, on February 28, 1895. He is twenty-one years of age; the left lower extremity was found to be fairly well developed, but the ankle was weak, and the foot was "flat;" the right limb presented very great atrophy in its entire extent, and the foot was exceedingly rigid and in the position of equino-varus; the patient walked on the dorsum; the astragalus was dislocated forward, as is usual in such cases. The great wasting of one limb and the partial feebleness in the other seemed to indicate the malady was not congenital, but as a result of an early attack of infantile paralysis.

The operation was performed March 3d, and consisted in dividing the tendo Achillis, tibialis anticus, the flexor tendons of all the toes, and the plantar fascia; the excision of the astragalus and a portion of the scaphoid, which hindered a perfect right-angle position of the foot; the foot was then carefully dressed and placed upon a right-angle tin splint; the wound closed by primary union, and at the end of three weeks a well-fitting shoe and brace was substituted—good ankle motion has been secured.

Case II is also a male, aged twenty-two years, who was sent from Osceola, Pa., to the Orthopedic Hospital and admitted March 13th and operated upon the following day. The deformity was inveterate equino-varus, and probably congenital. The case was almost identical with the one just presented, and the same operation was performed. It is now only sixteen days since, and the wound, it will be observed has united, and the ankle shows good but not voluntary motion. The position of the foot is normal.

I thought it might be of interest to the Fellows of the Academy to see these recent cases, one being a month, and the other only sixteen days after the operation.

DISCUSSION.

Dr. J. Ewing Mears: Do the articulations give any trouble after the operation?

Dr. Morton: I have not seen bad consequences after any of my operations, and I have done the operation in a large number of cases.

Dr. Mears: It is interesting to know that synovitis does not occur, as the operation involves a number of the articulations of the tarsus.

Dr. Morton: I did not have synovitis in a single case, and generally there is no rise in temperature or any evidence of reaction.

Dr. Henry Wharton: Is not the plantar fascia a very great bar to the correction of the deformity, and is it not necessary to divide it in many cases?

Dr. Morton: Yes; in every case in my experience.

Dr. Wharton: It has been my experience also that the plantar fascia is a bar to the correction of the deformity and has to be divided. I have had a number of cases of equino-varus in children and found excision of the astragalus the only thing to be done in these inveterate cases. The results obtained are so much better and are more permanent than by the old method of simply dividing tendons. It has been particularly useful in the case of children of ten or twelve years of age, where the operation of division of tendons has been done or repeatedly done in infancy, without removing the deformity. In such cases there is nothing to be done but to divide the tendons and fascia and excise the astragalus.

DR. JOHN H. BRINTON presented a specimen consisting of a

LARGE OXALIC ACID CALCULUS TAKEN FROM THE HUMAN BLADDER.

I exhibit here a rather large vesical oxalate-of-lime calculus which I removed several months ago at my clinic at the Jefferson College Hospital. The patient was a German, forty-six years of age, a blacksmith from the interior of the State. He had had symptoms of stone for twenty-five years. I made a longitudinal incision into the bladder by the supra-pubic operation and attempted to remove the stone, but found that it was impossible to do so until I had enlarged the bladder opening by a crucial incision. I did this in order to avoid injuring the peritoneum. I then removed this spherical oxalate stone, fully two-and-a-half inches in diameter, and which weighed six ounces when taken out. It is the largest oxalate calculus that I know of in this city. It is so hard that when I took it to a lapidary he tried to cut it with a circular saw; but abandoned it, as he said it would injure his wheel. The surface of this stone is studded with small prominences containing minute brilliant crystals which look like diamonds. The surface is quite rough. It is noteworthy in that the patient carried the stone for twenty-five years and that it gave him comparatively little trouble. In fact, he did not complain of great pain, but said that he knew he had a stone because he could feel it, through the abdomen, with his fingers. The man went home at the expiration of four weeks, having recovered without any bad symptoms.

DISCUSSION.

DR. T. G. MORTON: The remarks of Dr. Brinton remind me of a case which occurred some years ago. I was making a post-mortem examination of an elderly Quaker gentleman who had been for many years a patient of Dr. Wistar. We examined the various organs, and finally we opened the urinary bladder, in which we discovered a large calculus, which must have been growing for many years, and yet it had not given rise to any pain or annoyance, for, if it had, he would have spoken of it to Dr. Wistar. who had been his physician during this time. He apparently had no symptoms of bladder trouble, or none of any consequence.

DR. BRINTON: It is hard to understand why a large stone like this would cause so little pain. There must have been a time when the stone was juvenile and much smaller, and should have caused pain, but the patient said that it had not given him any great trouble, and that he had continued work at his trade until coming to this city for operation.

DR. WHARTON: Large stones do not give as much trouble as small ones. I remember a case of a child whom I operated upon some years ago, who had stone in the bladder and suffered very much from pain and tenesmus, with hemorrhage from the nose, and he also had sub-conjunctival hemorrhages during micturition. In this case the stone that caused so much disturbance only weighed thirteen-and-a-half grains.

DR. J. M. BARTON: Most of the pain in cases of stone in the bladder is owing to the attempt of the patient to empty the bladder, the stone obstructs the urethral opening, acts as a ballvalve and stops the current of urine. The patient continues the pressure, but the ball-valve will not allow the water to escape from the bladder, and the increased pressure leads to enlargement of the muscular bundles and to hypertrophy of the middle coat of the bladder. When the stone gets larger it is less apt to act as a ball-valve, and may give less trouble. The extreme roughness of this stone would prevent its acting as a ball-valve and would account for the absence of pain.

DR. MEARS: I agree in the opinions expressed that small stones give the most trouble and also in the explanation just given by Dr. Barton of the cause of the pain. Some years ago I was called to see a patient who had great trouble in micturition and suffered great pain from stone in the bladder. I removed the stone and found it the size of an almond kernel, although it had caused a good deal of pain and hemorrhage. The stone presented to-night is certainly very interesting. It is of interest to inquire how this stone has grown. Was the stone encysted?

DR. BRINTON: No, it was not. The bladder was thickened and contracted around it, so that there was not much cavity beside that occupied by the stone. The patient had constant dribbling of urine, because the bladder could not hold any water. The mucous membrane, from

pressure on the irregular surface of the stone, presented a very bad and reticulated appearance from chronic inflammation.

Dr. Mears: The man performed very active work at his trade as a blacksmith, which would probably change the position of the stone and keep it from becoming encysted.

Dr. Thomas S. K. Morton: Why did he have incontinence of urine?

Dr. Brinton: I suppose because there was so little cavity in the bladder to hold water. The stone occupied too much space.

Dr. T. G. Morton: It was strange that a stone of this weight did not cause ulceration and ulcerate its way out of the bladder into the rectum or perineum.

Dr. Brinton. There was suppuration, and the bladder looked and felt so ragged when I took out the stone that I made an unfavorable prognosis. But he did very well after the operation, and I kept him in bed a week longer than usual to prevent any ill results. He had a muscular abdomen, not very fat, probably owing to his blacksmith work. In reply to the President, I would state that no marked bowel symptoms were complained of in this case.

Dr. John H. Brinton, spoke

ON THE USE OF ESMARCH'S HÆMOSTATIC BANDAGE.

The few remarks I have to make on the subject do not rise to the dignity of a paper; I simply wish to bring to the consideration of the Academy some objections to, or dangers from, the use of Esmarch's bandage as a constricting and controlling band. I have used the elastic bandage for many years, and I have had several cases in which the results were not altogether satisfactory.

For instance, a number of years ago I operated at my clinic upon a woman who suffered from some serious bone disease of her leg. The Esmarch bandage was applied from the foot to the lower thigh, and the constricting band (the India-rubber tubing first in vogue) was placed just above the knee by a skilful hospital colleague, now deceased. There was no bleeding during the operation. The bandage had been applied and the operation was begun with the leg semi-flexed upon the thigh, but during the operation the limb was extended. After the operation was finished I found that the constricting band had deeply divided the muscular tissues, posteriorly, almost to the bone. The large vessels and nerves were not injured. This damage resulted, not from the direct constricting force or pressure, but from the tearing of the tissues, firmly fixed above, by the extension of the leg during the operation. I was much annoyed by the accident, and dreaded the results. The patient, however, made a very good recovery; but the incident made a deep impression upon my mind.

In this connection, I ask if any injurious effects of a similar kind have ever been noticed by the Fellows of the Academy from the movement of the limb after the constricting band had been applied? Of course, we all know that the first roller should not be applied too tightly over an ulcerating surface or a tumor, for fear of driving morbid material from the affected spot into the general circulation. There is another point about which I would like to ask the experience of the Academy. It is in relation to the Esmarch bandage and secondary hemorrhage. A few weeks ago I made use of the Esmarch on a case of amputation at the knee-joint. This is an amputation that I had done many times during our late war, and had then often noticed a tendency to consecutive secondary hemorrhage. In the two cases upon whom I did this amputation about a month ago I found a troublesome hemorrhage coming on about six hours afterward. I operated about 2 o'clock, and was called about 8 o'clock on account of bleeding. It was not in either case a free hemorrhage, but rather a persistent oozing from tissues which did not bleed at the time of operation. It came from the superior articular branches, and not from the azygos or inferior articular vessels, as the popliteal artery had been divided on the line of the articulation above their usual origin. I was obliged to open the stump and apply eight or ten ligatures to arrest the hemorrhage. I am unable to tell whether this hemorrhage was produced indirectly by the rubber-constricting band or whether it resulted from some peculiarity of the case. It is possible that the band may have exerted undue pressure on the smaller vessels, producing vasomoter

paresis, impairing their contractile power, and so have favored a post-operative enlargement, and a consequent reactionary or consecutive bleeding.

In our old war times I have participated in many amputations at the knee, and I am certain that I have often noticed this tendency to consecutive hemorrhage. My object in bringing up this subject was to ask if any Fellow of the Academy has at any time observed any evil effects from the constricting band of the Esmarch apparatus, and also whether secondary hemorrhage may not be the result of its use.

DISCUSSION.

DR. H. R. WHARTON: I would ask if Dr. Brinton has noticed any difference as regards hemorrhage when the roller is applied first and the constricting band second and when the constircting band is used alone?

DR. BRINTON. I have always used the first method, and cannot, therefore, answer from my own experience.

DR. WHARTON: I think that there is always more hemorrhage after applying the elastic bandage, followed by the elastic strap, than by simply applying the strap. I think that there is a likelihood that the band is applied too tightly in many instances. The secret is in applying it with just sufficient force to do no damage, and simply to temporarily control the circulation. I have seen no cases injured by the use of the Esmarch tube or strap, but think its use is likely to produce more consecutive hemorrhage.

Owing to the death from consecutive hemorrhage after the use of the Esmarch bandage a number of years ago, we have not, at the Children's Hospital, for many years used the Esmarch bandage or strap in cases of excision of the knee-joint. The most satisfactory use of the Esmarch bandage is for operations upon bone, for necrosis or caries. Another use for the Esmarch is in searching for foreign bodies, such as needles, etc., in the tissues, the search can be made with so much more comfort and with a greater chance of finding the foreign body if we first apply the Esmarch bandage and render the parts perfectly bloodless.

DR. W. BARTON HOPKINS: I can fully corrobrate the statement regarding the risk of applying the circular turns of Esmarch too tightly, as I have for several years been in the habit of demonstrating the immense constricting force which these turns are capable of exerting. By drawing each turn with the utmost tension around a bit of white pine wood a decided crease may be made in it, fully demonstrating its power and giving an object lesson which is not easily forgotten.

DR. JOSEPH HEARN: The Esmarch is generally applied too tightly. It is not necessary to use so much force. I can make a part bloodless simply by the application of my hand. My experience has been limited with secondary hemorrhage, as I have had no secondary hemorrhage. I apply the Esmarch very lightly, and always apply it myself. I only apply ligatures to the larger vessels, and have never had occasion to open a stump for secondary hemorrhage.

DR. BARTON: I have nothing to add to what has been said, except that in cases of resection for ununited fracture I have found the Esmarch bandage unsuited, on account of the large amount of blood thrown out afterward. In operating for ununited fracture of the humerus I would not use the Esmarch bandage, as I have had to remove the permanent plaster dressings for this cause.

DR. MEARS: I was so much impressed with the harmful effects of the tube of the Esmarch apparatus that I substituted for it a flat rubber band, and reported its use in two operations in the *Philadelphia Medical Times*, August 15th, 1874. I have seen a number of evil effects from the application of the tube, such as paralysis from pressure upon the nerves. I always use the band in preference to the tube, as being less injurious.

DR. WILLIAM H. TAYLOR: I have seen the Esmarch bandage applied too tightly, and have myself been very careful in this respect. In excision of the knee I have usually done without the roller bandage, and have used a wide band for the purpose of constriction. In all these cases there is a good deal of oozing, and after excision of the knee this oozing is decidedly increased by the use of the bandage.

DR. THOMAS S. K. MORTON: With regard to the Esmarch roller bandage, I seldom use it any more for operations on the extremities, having had demonstrated to me, when in Glasgow, by Mr. Macewen his method of making the limb bloodless. By elevating the limb for a few minutes we observe after a time that a spasm

of the bloodvessels occurs and the limb becomes bloodless, and then the constricting band can be applied. With regard to the application of the bandage, I do not intrust this to an assistant, but always apply it myself. I always use the narrow strap and not the tube. I take this opportunity of saying that the Esmarch apparatus, as sent out by the instrument makers, is usually defective, because the bandage is too narrow; it should be wider. With regard to the paralysis following the application of the constricting band, it is most liable to occur when it is used just above the knee or elbow, and especially the latter, on account of the course of the musculospiral nerve. This occurs so frequently that we should prohibit the use of the Esmarch bandage around or above the joints.

DR. BRINTON: As a matter of historic record and justice, I wish to say in regard to Dr. Morton's description of the method of making a limb bloodless, as practised by Macewen, that this method probably antedates the present day. I saw it practised many years ago at the Jefferson College by the late Professor Joseph Pancoast.

DR. T. G. MORTON: I also remember seeing Dr. Pancoast applying a broad bandage to a limb in order to reduce the amount of blood in it, and take off the bandage before the operation. This was long before the Esmarch bandage was used.

DR. THOMAS S. K. MORTON: I think that I have been misunderstood. There was no bandage applied by Macewen; he simply elevated the limb and produced a contraction of the arterioles, which made the limb bloodless before applying the strap.

DR. T. G. MORTON: It is very remarkable in Dr. Brinton's case that the tissues were divided. Were the muscles cut or only the skin?

DR. BRINTON: The skin was torn slightly at one point and the muscles were distinctly cut through. I have not seen this accident mentioned in treatises on surgery, but in the *American Text-Book of Surgery* it is stated that there should not be any motion of the limb after the band has been put on.

DR. T. G. MORTON: I have done very many operations upon the knee, but no amputation at the knee-joint since the war. I have not, in many years, had any secondary hemorrhage.

DR. WHARTON: I have recently seen very little secondary hemorrhage. I had a case of reamputation of the leg last summer, where I had to apply the Esmarch bandage where consecutive hemorrhage occurred, and I had to open the stump and tie the vessels. I have not noticed any special liability to hemorrhage after operations at the knee-joints.

DR. T. G. MORTON: In amputating at the knee, did Dr. Brinton remove the condyles or leave them?

DR. BRINTON: I referred rather loosely to these amputations as "at the knee." In each case I sawed off a portion of the condyles, if necessary, to bring the flaps together, but there was not any hemorrhage from the bone.

DR. T. G. MORTON: What was the nature of the injury or disease?

DR. BRINTON: Both were cases of sarcoma.

DR. T. S. K. MORTON: Might not that have been the cause of the hemorrhage? I have noticed that in cases of operation for sarcoma there was much more tendency to bleeding than in ordinary amputations for injury. The vessels are often enlarged.

DR. BRINTON: The vessels did not appear enlarged.

DR. HOPKINS: I have not seen any hemorrhage, except after sloughing.

DR. HEARN: I have not had any experience of this kind, and never have opened a stump for hemorrhage.

DR. BRINTON: I might say, to correct a possible misapprehension, that, although I have of late years done many amputations, these are the only two in which secondary hemorrhage occurred.

EDITOR MEDICAL AND SURGICAL REPORTER.

Dear Sir:—There is evident error in the formula "Sedative Cough Mixture in Phthesis," page 731, Vol lxxii, May 25th, 1895.

Liquor Strychudæ.....℥i should read
" " .....f℥i
Tufus, rosa acid ad.....℥ vi should read
" " .....f℥ vi

I need explain no further than to say that I ordered it "ad f℥ vi." But you will see the Liquor Strychudæ should be f℥ i instead of f℥ i.

Respectfully,
J. M. SHAFFER, M. D.

Koekuk, Ia.

PERISCOPE.

IN CHARGE OF WM. E. PARKE, A.M., M.D.

SURGERY.

Surgical Treatment of Vaginismus.

Froelich (*Revue Medico-Chirurgicale des Maladies des Femmes,*) practiced dilatation twice in the case of rebellious vaginismus, but without favorable results. He then performed the following operation. Two incisions, each two inches in length, were made upon the posterior wall of the vagina to the right and left of the middle line, a large Sims's speculum was then introduced, and as a result of the extreme dilatation produced by the instrument the antero-posterior linear wounds were transformed into two lozenge-shaped wounds with their transverse diameter the longer. The lower edges of these wounds were then freed by dissection and were sutured to the upper edge, thus making a line of suture running at right angles to the original cut and very considerably enlarging the vaginal introitus. The patient was permanently cured, and was found to be well two or three years later.

Asafetida in Obstetrical and Gynecological Practice.

Warman (*Therap. Monats.*) lays stress on the insufficiency of the remedies hitherto recommended in cases of abortion, pointing out that small doses of opium frequently disappoint, whereas large and repeated doses may prove injurious, both being of little value with patients subject to the habit of aborting. The author was therefore readily disposed to employ asafetida, as first recommended by Italian obstetricians. It was usually administered in pills containing one and a half grain, though an enema containing the tincture was soon preferred in cases of threatening abortion. The author found the drug most efficacious in reducing the hemorrhage which is prone to appear subsequently. Even with a very severe and alarming onset the first dose appeared to exert a most tranquillizing effect, and led to a gradual separation of the ovum unattended by contractions. Several instances are described at length to illustrate this, but the material at the author's command is insufficient to warrant him in ascribing to asafetida prophylactic properties. It is otherwise where habitual abortion has existed, and a successful issue in a most obstinate case is described, five in all having been observed by the author. To these patients the pills are administered, commencing with two per diemand increasing to ten, the number subsequently being again reduced. No unpleasant symptoms were produced, but, on the other hand, the action of the bowels was very much assisted, to which the author ascribes much of the success in those cases of what he terms "abortia habiturlis."—*British Medical Journal.*

GYNECOLOGY.

Conservative and Operative Treatment of Pelvic Inflammation.

Doleris (*Nouv. Arch. d'Obstet. et de Gynec.,*) defends the conservative treatment of chronic pelvic inflammatory diseases. He insists that removal of appendages and hysterectomy are only justifiable in very chronic cases. No active steps should be taken when painful or subacute parametritis is present. Operations should be undertaken soon after the catamenial period. Neurotic patients must be handled with caution. They show symptoms which mislead the observer, such as great pain with trifling lesions or little pain when there is extensive disease. As to the alleged intolerance of a patient's system to prolonged therapeutical treatment, the surgeon, however conscientious, is apt to fear complications which are improbable in any one case, especially if the patient be kept out of harm's way by her medical adviser. The patient herself is usually quite content to wait. Doleris believes that dilatation of the cervix, drainage, and the use of the curette are sufficient to cure a majority of cases of chronic disease of the appendages which most authorities would doom to removal of the diseased organs. The precautions above given apply to this conservative, as they do to operative, treatment. Indeed, in one case cited by operators as an instance of the danger of the conservative method, the curette was used when posterior parametritis existed. Bad symptoms followed and the appendages were removed, and not till after the abdominal section did the patient die.

THERAPEUTICS.

Treatment of Cyanide Poisoning.

Antal (*Physiol. Studien aus d. Univ. Budapest*) observes that although the cyanides are the strongest of poisons, yet the rapid form of death only occurs in a small proportion of cases of poisoning by them. Atropine recommended by Preyer against the remote effects has given negative results. Potassic permanganate used by Kossa is perhaps the most efficient of chemical antidotes, yet it also is useless when the poison has got into the circulation. The author has investigated the action of cobaltum nitricum oxydulatum in this respect. When cyanides are present in the stomach of an animal, and a solution of this cobalt salt is introduced, a harmless potassic cobalticyanide (K_3CoCy_6) is formed. That the cobalt salt can render absorbed cyanides harmless is due to the rapidity of its absorption and to the small quantity needed to make large quantities of cyanide inert. As regards the physiological action of cobalt salts little is known at present;

the excretion takes place through the kidneys, and the author believes them to have a powerful diuretic effect. The toxicity of the cobalt salts depends entirely on their concentration, as the author demonstrates by his experiments. In ½ to 1 per cent. solutions they have no definite action on the functions of the heart, and the red blood cells are not altered. The author records a series of experiments to show the antidotal properties of the above named cobalt salt. When rabbits or dogs are given a lethal dose of cyanide, and a ½ to 1 per cent. of the cobalt salt is introdnced into the stomach, no poisonous effects are produced. Experiments are so related which show that this solution, subcutaneously injected, will also neutralize the effects of absorbed cyanide. The author concludes that in man, to render inert already absorbed cyanide, ½ per cent. solution of the above named salt (10 to 30 c.cm.) should be injected subcutaneously; at the same time the same solution should be given by the mouth or, if that is impossible, passed into the stomach by means of a tube to neutralize any cyanides still present there.—*Brit. Med. Jour.*

Tetanus Antitoxin in "Kopftetanus."

G. Caretti (*Rif. Med.*,) reports the following case: On September 8th, 1894, he was called to a peasant woman, aged 44, who had fallen from a cart on her head. He found a lacerated contused wound on the forehead, extending down to the bone to which an improvised dressing of dirty rags had been applied. There was slight swelling for about a centimetre around the edges of the wound. He carefully disinfected the part with sublimate solution (1 in 1,000), put in three carbolized silk sutures, and appled an antiseptic dressing. On the following days the inflammation of the neighbouring parts increased, and œdema developed on the eyelids and cheeks. This was relieved by squeezing out a little pus at one of the points of suture, and by the seventh day, when perfect union of the wound made it possible to remove the sutures, it had almost entirely disappeared. On the previous day (sixth since the injury) the patient had noticed a certain difficulty in opening her mouth, and transient pains with slight contractions of the masseter muscles. Recognizing that the symptoms pointed to the onset of tetanus, the author prescribed a draught of 4 grammes of chloral and bromide of potassium, half to be taken at once, and half the following morning. On September 16th the trismus had reached such a degree that only a coin about the size of a threepenny-piece could be passed flatwise between the teeth. A supply of anti toxin was at once procurred from Dottoressa Cattani, and a dose of 2.25 grammes dissolved in 25 grammes of sterilised water was injected under the skin of the abdomen on September 16. On the following morning the trismus was somewhat less, but slight contraction of muscles at the back of the neck were noticed. Anti-toxin was injected as before. On September 18th the general condition was satisfctoro, but the lockjaw was complete; an injection of 1.10 gramme of anti-toxin was given. The symptoms being somewhat worse on the evening of the 18th, another injection of the same amount was given. The patient was able to take liquid nourishment by sucking it through an aperture between the teeth formed by the powerful retraction of the lower jaw. The movements of the tongue and of deglutition were performed without difficulty. Another injection of 1.10 gramme was given. The patient suffered from sleeplessness and complained of severe pains in the head and along the massater; there was facial paralysis on both sides. The temperature was not raised, and consciousness was undisturbed, and apart from the lockjaw and facial paralysis the patient was fairly well in herself. She remained in much the same condition until the beginning of October, when she began slowly to improve, but it was not till the middle of that month that she was able to open her mouth sufficiently. On November 3d the author was able to announce to Professor Tizzoni that the patient was completely cured. He points out that the progress of the diseased was checked immediately after the administration of the antitoxin was begun; although on September 17th there was some appearance of the posterior muscles of the neck being invaded, this soon passed off. The author attributes the fact that no spasm of the pharyngeal muscles occurred to the remedial influence of the antitoxin. He refers to another case of "kopftetanus" reported by Giusti and Bonajuti in the *Gazzetta degli Ospitali*, No. 56, 1894, which was cured by Tizzoni's antitoxin.

NEWS AND MISCELLANY.